

# Industrial **System** Solution Guide



2017



# 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,

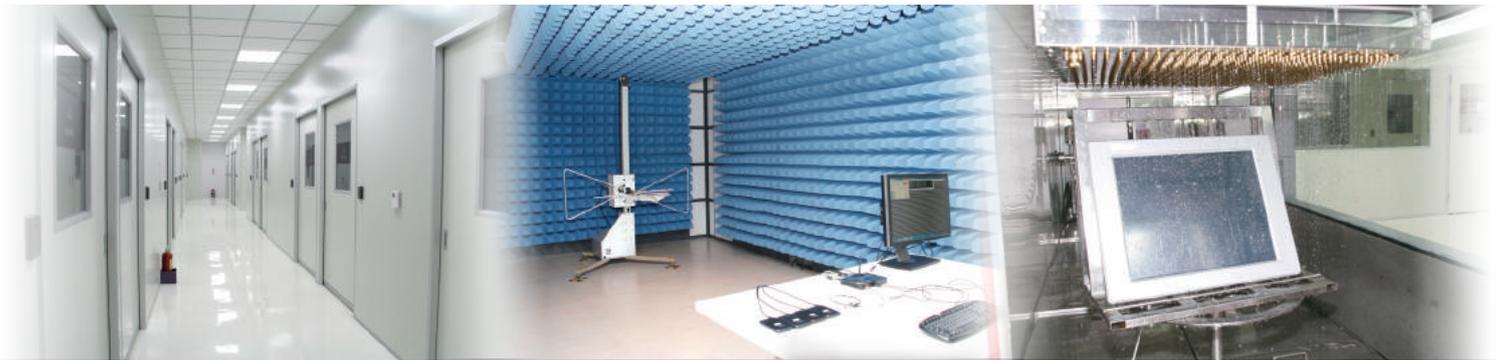
global operation and flexible business service help you meet the time-to-market requirement and reduce your new product introduction cycles as well as the costs of conducting business.

### ■ 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



## IPQC

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



## 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.



## Assembly

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

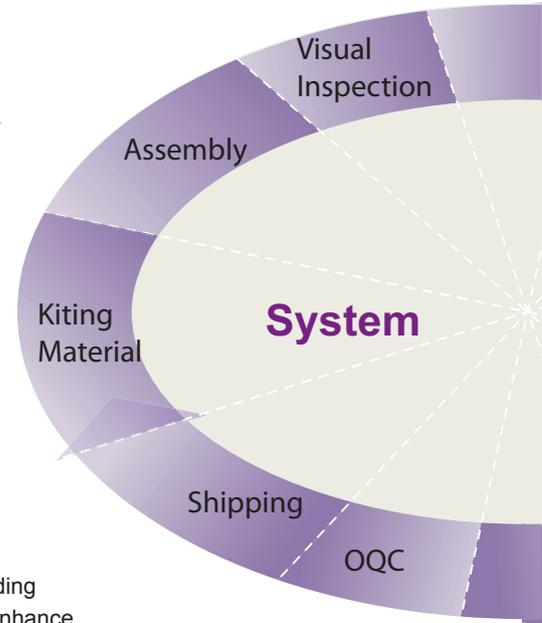
## Shipping

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

ISO 28000:2007 specifies the requirements for a security management system, including those aspects critical to security assurance of the supply chain.



## Certifications

ISO 9000 deals with the fundamentals of quality management systems, including the eight management principles on which the family of standards is based.



## Certifications

The ISO 14000 environmental management standards exist to help organizations minimize how their operations negatively affect the environment and comply with applicable laws, regulations, and other environmentally oriented requirements and continually improve in the above.



### 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.



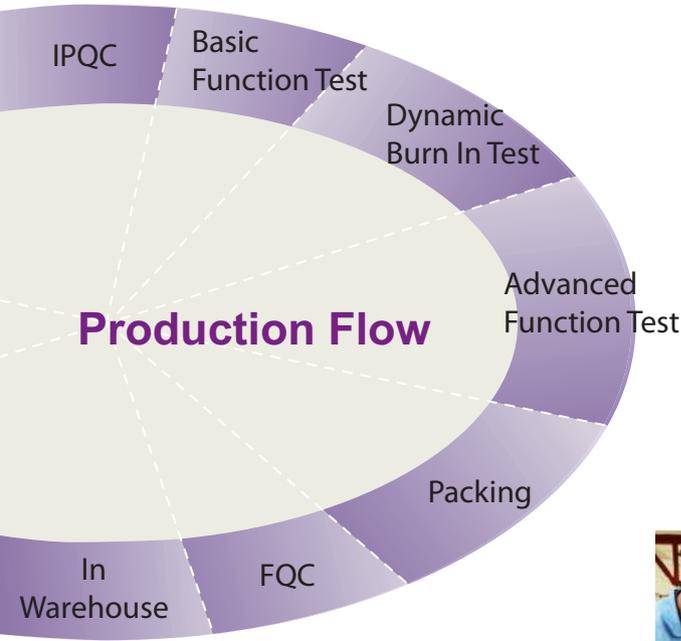
### Packing

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

ISO 13485 is an ISO standard that represents the requirements for a comprehensive management system for the design and manufacture of medical devices.



### Certifications

Quality management systems -- Particular requirements for the application of ISO 9001:2008 for automotive production and relevant service part organizations



### Certifications

OHSAS 18001:2007 is a standard which represent her highly regards labors' safety, the commitment to employees' health management and continuously improvement to the company and society.

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	11-16	Embedded System	25	Design Concept for WEBS-35C3	39	Design Concept for Chumpi



WEBS-21B0

- 18 WEBS-21B0**  
Embedded Compact Fan-less system with Intel® Braswell based NANO-ITX Board



WEBS-3560B

- 29 WEBS-3560B**  
Embedded Rugged Fan-less system with Intel® Celeron and Core™ i5/i7 based Mini-ITX Board



WEBS-21A0

- 19 WEBS-21A0**  
Embedded Rugged Fan-less system with Intel® Broadwell-U Core™ i SoC based NANO-ITX Board



WEBS-3392

- 30 WEBS-3392**  
Embedded Rugged Fan-less system with Intel® Atom™ E3845/J1900 based Mini-ITX Board



WEBS-2190

- 20 WEBS-2190**  
Embedded Rugged Fan-less system with Intel® Atom™ E3800 Series based NANO-ITX Board



WEBS-5491

- 31 WEBS-5491**  
Embedded Rugged Fan-less system with Intel® Atom™ E3845 specific form factor Board



WEBS-2170

- 21 WEBS-2170**  
Embedded Rugged Fan-less system with Intel® Atom™ D2550 based NANO-ITX Board



WEBS-5481

- 33 WEBS-5481**  
Embedded Rugged Fan-less system with Intel® Celeron and Core™ i3/i5/i7 based specific form factor board



WEBS-1371

- 23 WEBS-1371**  
Embedded Rugged Fan-less system with Intel® Atom™ D2550 based 3.5" ECX Board



WEBS-5481-S

- 34 WEBS-5481-S**  
Embedded Rugged Fan-less system with Intel® Celeron and Core™ i3/i5/i7 based specific form factor board



WEBS-35C1

- 24 WEBS-35C1**  
Embedded Rugged Fan-less system with Intel® 6<sup>th</sup> Skylake-S Core™ i3/i5/i7 based Mini-ITX Board



WEBS-5482-W

- 35 WEBS-5482-W**  
Embedded Rugged Fan-less system with Intel® Celeron and Core™ i3/i5/i7 based specific form factor board



WEBS-35C3

- 26 WEBS-35C3**  
Embedded Rugged Fan-less system with Intel® 6<sup>th</sup> Skylake-S Core™ i3/i5/i7 based Mini-ITX Board



RICH-33B0-8171

- 37 RICH-33B0-8171**  
Embedded Rugged Fan-less system with Intel® Celeron® Processor based Mini-ITX Board



RICH-33B0-8171-S

- 38 RICH-33B0-8171-S**  
Embedded Rugged Fan-less system with Intel® Celeron® Processor based Mini-ITX Board



WEBS-3581

- 27 WEBS-3581**  
Embedded Rugged Fan-less system with Intel® Celeron and Core™ i3/i5/i7 based Mini-ITX Board



Chumpi-5390

- 40 Chumpi-5390**  
Embedded Rugged Fan-less system with Intel® Atom™ E3845 specific form factor board



WEBS-3583

- 28 WEBS-3583**  
Embedded Rugged Fan-less system with Intel® Celeron and Core™ i3/i5/i7 based Mini-ITX Board



Chumpi-5391

- 41 Chumpi-5391**  
Embedded Rugged Fan-less system with Intel® Atom™ E3845 specific form factor board

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## INDUSTRIAL CHASSIS

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**45-46 RPC-500NC/L**  
19" 4U industrial rack-mount chassis



**55-56 AREMO-6163**  
6-slot full-sized industrial node chassis (Shoe-box)



**47-48 AREMO-4196**  
The Best Cost-Performance 19" 4U Height Pentium® 4 processor Based Rack-mount Computer



**57-58 AREMO-8164**  
8-slot full-size industrial node chassis (Shoe-box)



**49-50 AREMO-3194**  
19" 3U rack-mount chassis for ATX M/B platform



**59-60 AREMO-6182**  
6-slot full-size industrial node chassis (Shoe-box)



**51-52 AREMO-2173P**  
19" 2U industrial rack-mount chassis for PICMG backplane



**61-62 AREMO-4184**  
19" 4U Height rack-mount chassis with dual AREMO-6182 node chassis



**53-54 AREMO-2173MX**  
19" 2U industrial rack-mount chassis for Micro-ATX or mini-ITX mother board

## INDUSTRIAL PSU

PAGE 63-64 About Power Supply



**65 PLUTO-A1801PJ**  
180W Flex form factor Power supl with Active PFC Japan made capacitor 80PLUS and OVP,OCP,SCP



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



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



**69 GADIWA-B1120**  
120W DC/DC 12V Input/ATX output,Board Type Converter



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



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



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## INDUSTRIAL PSU



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



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



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



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



**73 GADIWA-3161**  
9V~27V/wide-input, 12V/output,  
Regulator Board Type



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



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



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



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



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



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



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



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

**79 Industrial Power Adapter**

## IoT INTRODUCTION

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IoT introduction

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Further Contact



**81-82 XM-1**  
Gateway solutions for the Internet of Things  
(IoT)



**83-84 DS- 1 + DS-1B**  
End Device (Sensor Node) solutions for the  
Internet of Things (IoT)



**83-84 DS-1 + DS-1B**  
End Device (Sensor Node) solutions for the  
Internet of Things (IoT)



**85 PI-QK10**  
Intel® Quark™ Platform as Intel® Gateway  
Solutions for the Internet of Things (IoT)



# What is WEBS

## WEBS: Portwell Intelligent Fan-less System

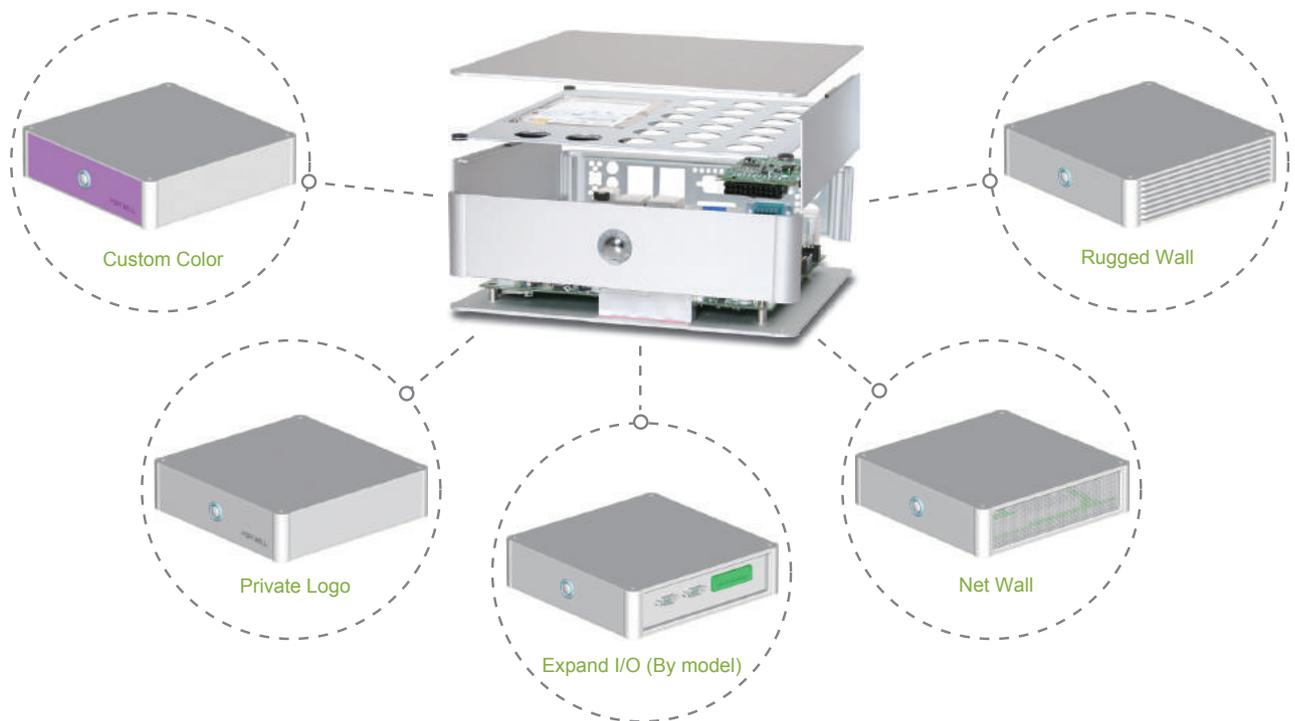
Compact, Flexible, Rugged Computing Systems

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.



# Quality Assurance

## ① Design & Analysis

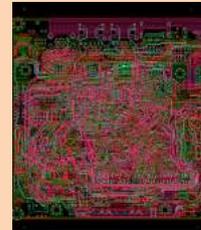
Portwell WEBS systems undergo quality assurance procedures during the critical early stages of development. Designing a stable product makes it easy for quality checking and complies with Design for Quality (DFQ).

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.

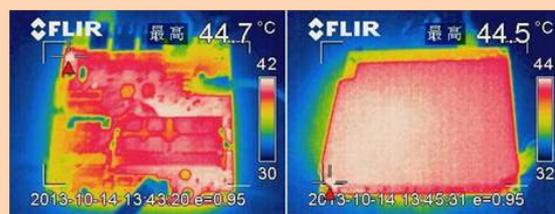
Some manufactures will claim they have solved the heat dissipation problem based on their calculations and data sets, but "seeing is believing!" So test your systems in our certified and advanced labs and see if your systems meet your specifications.

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

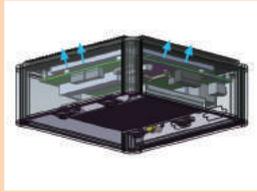


Thermal image of NANO-6060 M/B

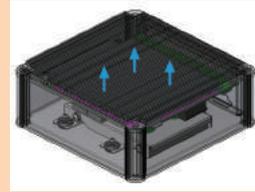


# Quality Assurance

**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.



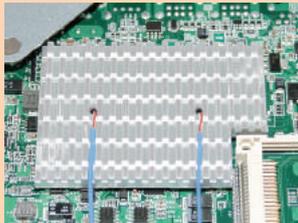
WEBS-2190 Heat-flow (Bottom)



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

# Embedded System



Model		WEBS-21B0	WEBS-21A0	WEBS-2190	WEBS-2170
M/B		NANO-6061	NANO-6050	NANO-6060	NANO-5050
Form Factor		NANO-ITX	NANO-ITX	NANO-ITX	NANO-ITX
System	CPU	Intel® Pentium®/Celeron® N3000 series processor	Intel® 5 <sup>th</sup> Generation ULT Core™ i Processor	Atom™ E2827 1.75GHz Atom™ E3845 1.91GHz	Atom™ D2550 1.86GHz
	Chipset	Intel® SoC	Intel® SoC	Intel® SoC	NM10
	BIOS	AMI uEFI	AMI uEFI	Phoenix uEFI	Phoenix uEFI
	Memory	DDR3L/8GB	DDR3L/8GB	DDR3L/4GB	DDR3/4GB
	Graphic Controller	Gen 8	HD Graphics 5500/6000	Gen 7	GMA3650
	Audio Codec	ALC892	ALC892	ALC892	ALC886
	Super I/O	EC ITE8528	EC ITE8528	EC ITE8528	W83627DHG
	Storage	2.5" SATA HDD/SSD mSATA, SD	2.5" SATA HDD/SSD mSATA	2.5" SATA HDD Micro-SD	2.5" SATA HDD CF-SATA
External I/O	Serial	1x RS-232/422/485	1x RS-232/422/485	1x RS-232/422/485	1x RS-232/422/485
	USB	2x USB3.0	2x USB2.0 1x USB3.0	2x USB3.0	2x USB2.0
	Display	VGA, DP	2x mini DP	VGA, DP	VGA, DP
	Ethernet	Intel® I211AT x 2	Intel® I218AT x 2	Intel® I210IT x 2	Intel® 82583V
	PS/2	N/A	N/A	N/A	N/A
	Audio	Line-out	Combo Jack Line-out, Mic-in	Line-out	Mic-in, Line-out
	D I/O	N/A	N/A	N/A	N/A
Expansion		M.2 (Type E)	Half-size Mini-PCle	Half-size Mini-PCle	Full-size Mini-PCle
PWR	System	DC 12V	DC 12V	DC 12V	DC 12V
Environment	OP Temp	0°C ~ 55°C	0°C ~ 50°C	-25°C ~ 60°C	-5°C ~ 45°C
	Stor. Temp	-20°C ~ 85°C	-20°C ~ 85°C	-40°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, 11 msec	50G, 11 msec
Mechanical	Dimension(WxDxH)	150 x 150 x 53 mm	150 x 150 x 62.6 mm	150 x 150 x 53 mm	150 x 150 x 53 mm
	Weight	1.8 kg	2 kg	1.3 kg	1.3 kg
Page		18	19	20	21



# Embedded System



Model		WEBS-1371	WEBS-35C1	WEBS-35C3
M/B		PEB-2772	WADE-8017	WADE-8017
Form Factor		3.5" ECX	Mini-ITX	Mini-ITX
System	CPU	Atom™ D2550 1.86GHz	Intel® 6 <sup>th</sup> Generation Desktop Core™ Processor	Intel® 6 <sup>th</sup> Generation Desktop Core™ Processor
	Chipset	NM10	Q170	Q170
	BIOS	Phoenix uEFI	AMI uEFI	AMI uEFI
	Memory	DDR3/4GB	DDR4/32GB	DDR4/32GB
	Graphic Controller	GMA3650	Gen 9	Gen 9
	Audio Codec	ALC886	ALC892	ALC892
	Super I/O	W83627UHG	ITE IT8728F	EC ITE8528 + Fintek F81216AD
	Storage	2.5" SATA HDD SATA DOM	2x 2.5" SATA HDD/SSD mSATA	2x 2.5" SATA HDD/SSD mSATA
External I/O	Serial	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	5x USB2.0	2x USB2.0 4x USB3.0	2x USB2.0 4x USB3.0
	Display	VGA, HDMI	VGA, DP, HDMI	VGA, DP, HDMI
	Ethernet	Intel® 82583V	Intel® I219LM + I211AT	Intel® I219LM + I211AT
	PS/2	N/A	N/A	N/A
	Audio	Line-in, Line-out, Mic-in	Line-in, Line-out, Mic-in	Line-in, Line-out, Mic-in
	D I/O	8-bit Digital I/O	8-bit Digital I/O	8-bit Digital I/O
Expansion		Full-size Mini-PCIe	Full-size Mini-PCIe M.2 (Type E)	Full-size Mini-PCIe M.2 (Type E) Multi PCIe+PCI options
PWR	System	DC 12V	DC 12V ~ 36V	DC 12V ~ 36V
Environment	OP Temp	-10°C ~ 50°C	-20°C ~ 50°C	-20°C ~ 50°C
	Stor. Temp	-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
	Vibratoin	5Grms/10-500Hz	5Grms/10-500Hz	5Grms/10-500Hz
	Shock	50G, 11 msec	50G, 11 msec	50G, 11 msec
Mechanical	Dimension(WxDxH)	200 x 150 x 51 mm	253 x 201 x 123 mm	253 x 201 x 123 mm
	Weight	1.3 kg	7 kg	7 kg
Page		<b>23</b>	<b>24</b>	<b>26</b>

# Embedded System



Model		WEBS-3581	WEBS-3583	WEBS-3560B	WEBS-3392
M/B		WADE-8015	WADE-8015	WADE-8020	WADE-8079
Form Factor		Mini-ITX	Mini-ITX	Mini-ITX	Mini-ITX
System	CPU	Intel® 4 <sup>th</sup> Generation Desktop Core™ Low Power Processor	Intel® 4 <sup>th</sup> Generation Desktop Core™ Low Power Processor	Intel® Core™ i5/i7 PGA 989 Mobile Processor	Atom™ E3845 1.91GHz Atom™ J1900 2GHz
	Chipset	Q87	Q87	QM57	Intel® SoC
	BIOS	Phoenix uEFI	Phoenix uEFI	AMI uEFI	Phoenix(EFI) BIOS
	Memory	DDR3/16GB	DDR3/16GB	DDR3/8GB	DDR3L/16GB
	Graphic Controller	HD Graphic 4000 Family	HD Graphic 4000 Family	GMA HD	HD Graphics 4600
	Audio Codec	ALC886	ALC886	ALC888	ALC892
	Super I/O	ITE IT8728F	ITE IT8728F	ITE IT8721F	Fintek F81216DG
	Storage	2 x 2.5" SATA HDD/SSD SATA DOM	2 x 2.5" SATA HDD/SSD SATA DOM	2.5" SATA HDD/SSD SATA DOM	2.5" SATA HDD/SSD mSATA
External I/O	Serial	4x RS-232 + 2x RS-232/422/485	4x RS-232 + 2x RS-232/422/485	3x RS-232 + 1x RS-232/422/485	3x RS-232 + 1x RS-232/422/485
	USB	2x USB2.0 4x USB3.0	4x USB2.0 4x USB3.0	6x USB2.0	4x USB2.0 1x USB3.0
	Display	VGA, DP, HDMI	VGA, DP, HDMI	VGA, DVI-D, HDMI	VGA, DVI-D, DP
	Ethernet	Intel® I217LM+I210AT	Intel® I217LM+I210AT	Intel® 82577LM+82574L	Intel® I210IT x 2
	PS/2	N/A	N/A	N/A	N/A
	Audio	Line-in, Line-out, Mic-in	Line-in, Line-out, Mic-in	Line-in, Line-out, Mic-in	N/A
	D I/O	8-bit Digital I/O	8-bit Digital I/O	8-bit Digital I/O	N/A
Expansion		Full-size Mini-PCIe	Full-size Mini-PCIe 2x PCIe (or 1x PCIe + 1x PCI)	Full-size Mini-PCIe	Half-size Mini-PCIe Full-size Mini-PCIe
PWR	System	DC 12V ~ 36V	DC 12V ~ 36V	DC 12V ~ 36V	DV 12V ~ 24V
Environment	OP Temp	-20°C ~ 50°C	-20°C ~ 50°C	-5°C ~ 50°C	-10°C ~ 45°C
	Stor. Temp	-40°C ~ 80°C	-40°C ~ 80°C	-20°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)	253 x 191 x 85 mm	253 x 193 x 120 mm	253 x 190 x 70 mm	200 x 200 x 51 mm
	Weight	4.6 kg	7 kg	4.2 kg	2.2 kg
Page		27	28	29	30



# Embedded System



Model		WEBS-5491	WEBS-5481	WEBS-5481-S	WEBS-5482-W
M/B		PEB-99A4-E3845	PEB-5731-W	PEB-5731-W	PEB-5731-W
Form Factor		Specific form factor 279 x 164 x 34 mm	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
System	CPU	Atom™ E3845 1.91GHz	Intel® 4 <sup>th</sup> Generation ULT Core™ i Processor	Intel® 4 <sup>th</sup> Generation ULT Core™ i Processor	Intel® 4 <sup>th</sup> Generation ULT Core™ i Processor
	Chipset	Intel® SoC	Intel® SoC	Intel® SoC	Intel® SoC
	BIOS	AMI uEFI BIOS	AMI uEFI	AMI uEFI	AMI uEFI
	Memory	DDR3L/8GB	DDR3L/16GB	DDR3L/16GB	DDR3L/16GB
	Graphic Controller	HD Graphics 4600	HD Graphic 4000 Family	HD Graphic 4000 Family	HD Graphic 4000 Family
	Audio Codec	ALC892	ALC892	ALC892	ALC892
	Super I/O	ITE IT8528E + Fintek F81216AD	EC ITE8528 + Fintek F81216AD	EC ITE8528 + Fintek F81216AD	EC ITE8528 + Fintek F81216AD
	Storage	2.5" SATA HDD/SSD, CF SD card	CFEX, 2.5" SATA HDD/SSD mSATA	CFEX, 2.5" SATA HDD/SSD mSATA	CFEX, 2.5" SATA HDD/SSD mSATA
External I/O	Serial	2x RS-232/422/485	1x RS-232 + 1x RS-232/422/485	1x RS-232 + 1x RS-232/422/485	3x RS-232 + 1x RS-232/422/485
	USB	3x USB2.0 1x USB3.0	2x USB2.0 2x USB3.0	2x USB2.0 2x USB3.0	2x USB2.0 2x USB3.0
	Display	DVI-I	DVI-D, DP, HDMI	DVI-D, DP, HDMI	DVI-D, DP, HDMI
	Ethernet	Intel® I210IT x 2	Intel® I218LM+I210AT	Intel® I218LM+I210AT	Intel® I218LM+I210AT
	PS/2	N/A	N/A	N/A	N/A
	Audio	Line-out	Line-out, Mic-in	Line-out, Mic-in	N/A
	D I/O	N/A	8-bit Digital I/O	8-bit Digital I/O	N/A
Expansion		Half-size Mini-PCIe	Full-size Mini-PCIe Half-size Mini-PCIe 2x Optional Graphic Module	Full-size Mini-PCIe Half-size Mini-PCIe	Full-size Mini-PCIe Half-size Mini-PCIe 1x PCIe
PWR	System	DC 12V ~ 24V	DV 12V ~ 24V	DC 12V ~ 24V	DC 12V ~ 24V
Environment	OP Temp	-30°C ~ 70°C	-20°C ~ 55°C	-20°C ~ 55°C	-20°C ~ 50°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)	279 x 164 x 34 mm	235 x 160 x 60 mm	235 x 160 x 50 mm	255 x 187 x 86 mm
	Weight	2.8 kg	2 kg	1.8 kg	5kg
Page		31	33	34	35

# Embedded System



Model		RICH-33B0-8171	RICH-33B0-8171-S
M/B		WADE-8171	WADE-8171
Form Factor		Mini-ITX	Mini-ITX
System	CPU	Intel® Celeron® N3000 series processor	Intel® Celeron® N3000 series processor
	Chipset	Intel® SoC	Intel® SoC
	BIOS	AMI uEFI	AMI uEFI
	Memory	DDR3L/8GB	DDR3L/8GB
	Graphic Controller	Intel® HD Graphics Family	Intel® HD Graphics Family
	Audio Codec	ALC887	ALC887
	Super I/O	Nuvoton NCT6106D	Nuvoton NCT6106D
	Storage	2.5" SATA HDD/SSD mSATA	2.5" SATA HDD/SSD mSATA
External I/O	Serial	3x RS-232 + 3x RS-232/422/485	3x RS-232/422/485
	USB	4x USB2.0 4x USB3.0	4x USB3.0
	Display	VGA, HDMI	VGA, HDMI
	Ethernet	Realtek RTL8111G x 2	Realtek RTL8111G x 2
	PS/2	K/B x1, Mouse x1	K/B x1, Mouse x1
	Audio	Line-out, Mic-in	Line-out, Mic-in
	D I/O	N/A	N/A
Expansion		Full-size Mini-PCle	Full-size Mini-PCle
PWR	System	DC 12V ~ 24V	DC 12V ~ 24V
Environment	OP Temp	0°C ~ 50°C	0°C ~ 50°C
	Stor. Temp	-20°C ~ 80°C	-20°C ~ 80°C
	Humidity	95%@40°C, non-condensing	95%@40°C, non-condensing
	Vibratoin	5Grms/10-500Hz	5Grms/10-500Hz
	Shock	50G, 11 msec	50G, 11 msec
Mechanical	imension(WxDxH)	200 x 200 x 45 mm	200 x 200 x 45 mm
	Weight	2 kg	2 kg
Page		37	38



# Embedded System



Model		CHUMPI-5390	CHUMPI-5391
M/B		PAB-1001	PAB-1001
Form Factor		Specific form factor 150 x 150 x 1.6 mm	Specific form factor 150 x 150 x 1.6 mm
System	CPU	Atom™ E3845 1.91GHz	Atom™ E3845 1.91GHz
	Chipset	Intel® SoC	Intel® SoC
	BIOS	AMI uEFI	AMI uEFI
	Memory	DDR3L/8GB	DDR3L/8GB
	Graphic Controller	Gen 7	Gen 7
	Audio Codec	N/A	ALC892
	Super I/O	EC ITE8528	EC ITE8528
	Storage	2.5" SATA HDD Half-size mSATA	2.5" SATA HDD/SSD Half-size mSATA
External I/O	Serial	2x RS-232/422/485 2x RS-232	2x RS-232/422/485 2x RS-232
	USB	1x USB3.0 3x USB2.0	1x USB3.0 3x USB2.0
	Display	VGA, HDMI	VGA, HDMI
	Ethernet	Intel® I210IT x 2	Intel® I210IT x 2
	PS/2	N/A	N/A
	Audio	N/A	Depending on Expansion Kit
	D I/O	8-bit Digital I/O	8-bit Digital I/O
Expansion		Full-size Mini-PCIe	Full-size Mini-PCIe 6x Expansion Kit Assembly
PWR	System	DC 12V ~ 24V	DC 12V ~ 24V
Environment	OP Temp	-30°C ~ 70°C	-30°C ~ 70°C
	Stor. Temp	-40°C ~ 80°C	-40°C ~ 80°C
	Humidity	95%@40°C, non-condensing	95%@40°C, non-condensing
	Vibratoin	5Grms/10-500Hz	5Grms/10-500Hz
	Shock	50G, 11 msec	50G, 11 msec
Mechanical	imension(WxDxH)	160 x 160 x 60 mm	247 x 160 x 60 mm
	Weight	2.0 kg	2.4 kg
Page		40	41

# 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)

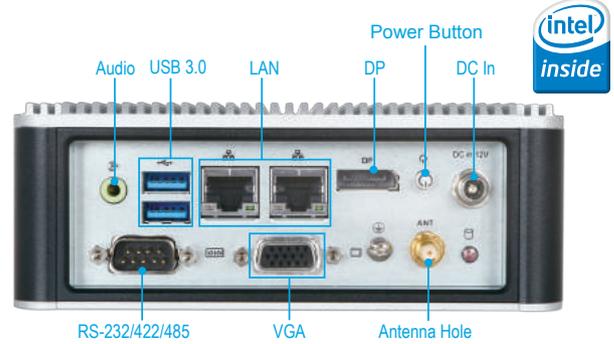


## Configuration

- **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-21B0

Embedded Compact Fan-less System with Intel®  
Braswell based NANO-ITX Board



The WEBS-21B0 builds on Intel® Braswell SoC and takes advantages of Intel® Pentium® /Celeron® Dual/Quad Core™ N3000 Series processor technologies, especially its vastly superior Quad-Core™ processing power and capability. The cost-effective CPU with high performance is good to use to build up a compact system, the WEBS-21B0, it supports M.2 socket (Type E) targeting IOT application.

## FEATURES

- Fan-less and Cable-less & Small and Exquisite design
- One 204-pin SODIMM supports DDR3L up to 8GB
- Intel® Braswell SoC platform
- 1x 2.5" SATA HDD/SSD, 1x mSATA, 1x SD card
- 1x M.2 socket (Type E)
- 1x Antenna hole for WiFi module to use
- OP Vibration: 5Grms/10~500Hz
- OP Shock: 50G, 11msec
- IP40 Rating

## ORDERING GUIDE

AS5-3451 (R).ATO.WEBS-21B0.NANO-ITX system.

## System

M/B	NANO-6061
System Chipset	Intel® Braswell SoC
CPU	Intel® Pentium®/Celeron® Dual/Quad Core™ N3000 series Processor (up to 6W)
BIOS	AMI uEFI BIOS (SPI ROM)
System Memory	One 204-pin SODIMM sockets supports DDR3L 1333/1600 MT/s SDRAM up to 8GB
Storage	1x 2.5" SATA HDD/SSD, 1x mSATA, 1x SD card
Watchdog Timer	Programmable by embedded controller
H/W Status Monitor	- Temperature (CPU & System) - Voltage (CPU Vcore, 12V, 5V, 3.3V, 1.35V)
Expansion	1x M.2 socket (Type E) with PCIe1, USB 2.0, SDIO, UART, or I2C signal

## External I/O

Serial Port	1x RS-232/422/485 (Selected by BIOS)
Display	1x VGA, 1x DP
USB	2x USB 3.0
Audio	Line-out (ALC892)
Ethernet	2x Gigabit Ethernet (Intel® I211AT)
Other	1x Antenna hole for WiFi module

## Power Supply Unit

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

## Environmental

Operation Temperature	0°C ~ 55°C
Storage Temperature	-20°C ~ 85°C
Relative Humidity	95%@40°C, non-condensing
Operation Vibration	5Grms/10~500Hz, IEC 60068-2-6
Operation Shock	50G, 11 msec, IEC 60068-2-27

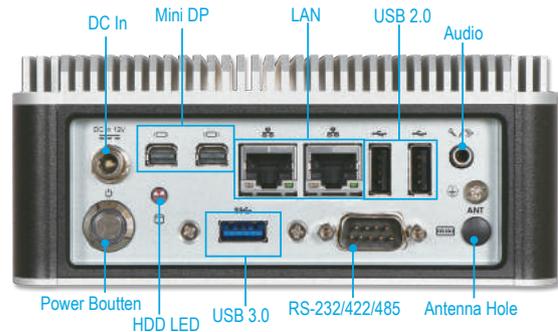
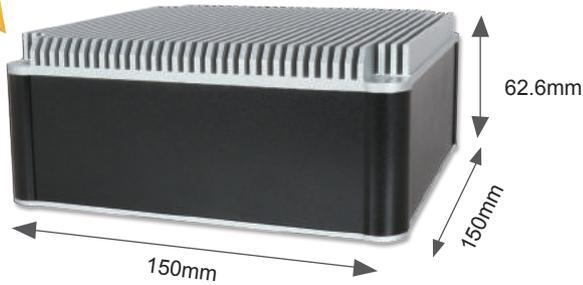
## Mechanical

Dimension	150(W) x 150(D) x 53(H) mm; 5.9"(W) x 5.9"(D) x 2.1"(H)
Weight	1.8kg
Mounting	Desk, Wall/Panel, and DIN Rail mounting



# WEBS-21A0

Embedded Rugged Fan-less System with Intel® Broadwell-U Core™ i SoC based NANO-ITX Board



The WEBS-21A0 builds on Intel® Broadwell-U Core™ i SoC and takes advantages of Intel® Core™ mobile technologies. that can support superior Dual-Core processing power and capability. Support two Gigabit Ethernet ports and one Half-Size Mini PCIe. The WEBS-21A0 is an ideal platform which with high performance 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
- One 204-pin SODIMM supports DDR3L up to 8GB
- Intel® Broadwell-U Core™ i SoC based platform
- 1x 2.5" SATA HDD/SSD, 1x mSATA
- 1x Half-size Mini-PCIe socket (USB+PCIe x1 signal)
- 1x Antenna hole for WiFi, 3G or GPS module to use
- OP Vibration: 5Grms/10~500Hz

## ORDERING GUIDE

AS5-3442	(R).WEBS-21A0.NANO-ITX system.
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## System

M/B	NANO-6050
System Chipset	Intel® Broadwell-U Core™ i SoC
CPU	Intel® Core™ i5-5350U/ i3-5010U Processors up to 2.2G (15W) in FCBGA1168 package
BIOS	AMI uEFI BIOS (SPI ROM)
Memory	One 204-pin SODIMM sockets supports DDR3L 1333/1600 MT/s SDRAM up to 8GB
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, 12V, 5V, 3.3V, RAM)
Expansion	1x Half-size Mini-PCIe socket

## External I/O

Serial Port	1x RS-232/422/485 (Selected by BIOS)
Display	2x Mini DP
USB	1x USB 3.0, 2x USB 2.0 (Optional kit: additional 2x USB3.0)
Audio	Audio Combo Jack Line-out /Mic-In (ALC892)
Ethernet	2x Gigabit Ethernet (Intel® I218AT)
Other	1x Antenna hole for WiFi, 3G or GPS module

## Power Supply Unit

Power Input	DC 12V
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## Environmental

Operation Temperature	0°C ~ 50°C
Storage Temperature	-20°C ~ 85°C
Relative Humidity	95%@40°C, non-condensing
Operation Vibration	5Grms/10-500Hz, IEC 60068-2-6
Operation Shock	50G, 11 msec, IEC 60068-2-27

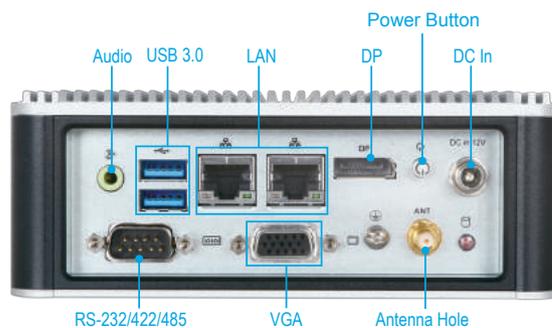
## Mechanical

Dimension	150(W) x 150(D) x 62.6(H) mm; 5.9"(W) x 2.5"(D) x 2.1"(H)
Weight	2 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 (Optional kit: additional 2x USB3.0 ;Expande 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 60068-2-6
Operation Shock	50G, 11 msec, IEC 60068-2-27

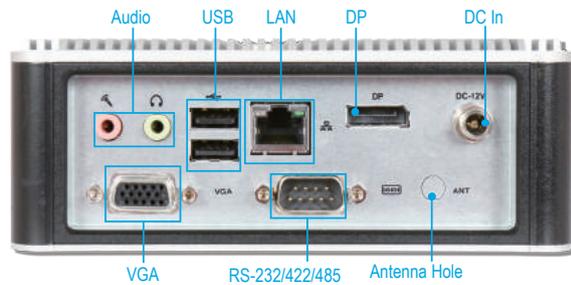
## Mechanical

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-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-PCIe socket (USB + PCIe 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-PCIe 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
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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 60068-2-6
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 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.

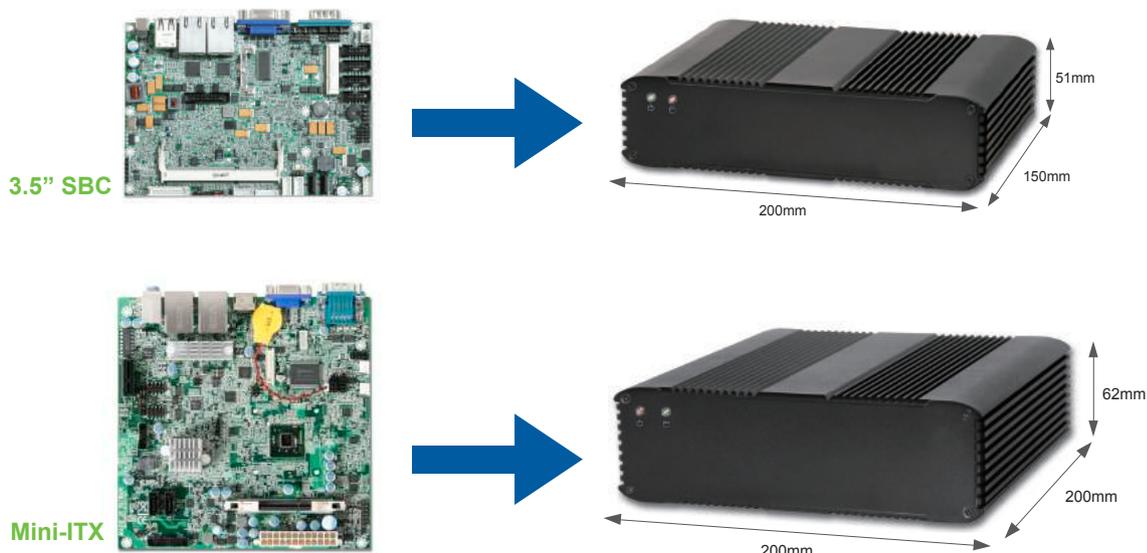


## Anti-Vibration & Shock design

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.

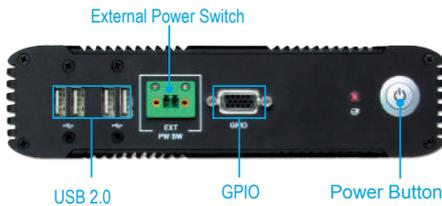
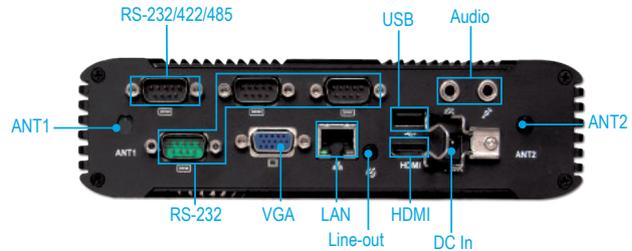
## Hot-Swap of Entry 3.5" SBC & Semi-middle MINI-ITX

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-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-PCIe 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.
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## 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-PCIe 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 60068-2-6
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-35C1

Embedded Rugged Fan-less System with Intel® 6<sup>th</sup> Skylake-S Core™ i3/i5/i7 based Mini-ITX Board



The WEBS-35C1 builds on Intel® desktop Q170 chipset and takes advantages of Intel® Core™ i3/i5/i7 desktop processor technologies that can support dual DDR4 memory. Support two Gigabit Ethernet ports, one M.2 socket and one Mini-PCIe socket. The WEBS-35C1 is an ideal platform with rich I/O and high resolution for POS, kiosk, digital signage, and surveillance security monitoring applications.

## FEATURES

- Intel® Core™ i High performance Fan-less Embedded Box PC
- 6<sup>th</sup> generation Intel® Skylake-S Core™ i3/i5/i7 Desktop processor (Quad-Core CPU supported)
- Dual UB-DIMM DDR4 up to 32GB
- 2x 2.5" SATA HDD/SSD, 1x mSATA
- Rich I/O is good for versatile applications
- 1x M.2 socket, 1x Full-size Mini-PCIe socket
- Rugged design is good for using in harsh environment

## ORDERING GUIDE

AS5-3460	(R).ATO.WEBS-35C1.Embedded rugged fan-less system with Intel Skylake-S Core i3/i5/i7 based MINI-ITX system.
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## System

M/B	WADE-8017
System Chipset	Intel® Q170
CPU	- Intel® Core™ i7-6700TE, 2.4GHz, 8M L2 Cache, up to 3.40 GHz, 35W TDP (4C/8T) - Intel® Core™ i5-6500TE, 2.3GHz, 4M L2 Cache, up to 3.30 GHz, 35W TDP (4C/4T) - Intel® Core™ i3-6100TE, 2.7GHz, 4M L2 Cache, 35W TDP (2C/4T) - Intel® Pentium® G4400TE, 2.9GHz, 3M L2 Cache, 35W TDP (2C/2T) - Intel® Celeron® G3900TE, 2.3GHz, 2M L2 Cache, 35W TDP (2C/2T)
FSB	AMI uFEI BIOS (SPI ROM)
BIOS	Dual 260-pin UB-DIMM socket supports DDR4 2133/1866 Non-ECC up to 32GB
System Memory	2x 2.5" SATA HDD/SSD, 1x mSATA (via mini-PCIe socket)
Storage	Programmable by embedded controller
Watchdog Timer	Programmable via S/W from 1 sec. to 255 min.
H/W Status Monitor	- Temperature (CPU & System) - Speed (CPU Fan & System Fan) - Voltage (CPU Vcore, 12V, 5V, 3.3V, VDIMM)
Expansion	- 1x M.2 socket (Type E) with PCIe1, USB2.0, SDIO, UART, or I2C signal - 1x Full-size Mini-PCIe socket (can switch to mSATA)

## 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 USB 3.0, 2x USB 2.0
Audio	Line-in/Line-out/Mic-in(ALC892)
Ethernet	2x Gigabit Ethernet (Intel® I219LM and Intel® I211AT)
GPIO	1x Programmable 8-bit Digital I/O
Other	- 2x Antenna hole for WiFi, 3G/GPS or 4G LTE module - 1x EXT Power Switc

## Power Supply Unit

Power Input	DC 12V ~ 36V with 3-pin Terminal block Connector
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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 60068-2-6
Operation Shock	50G, 11 msec, IEC 60068-2-27

## Mechanical

Dimension	253(W) x 201(D) x 83(H) mm
Weight	4.5kg
Mounting	Wall mounting



# Design Concept for WEBS-35C3

Portwell's WEBS-35C3 is high performance fanless Box PC, powered by the Intel® last generation Intel® Core™ i7/i5/i3/Celeron® processor.

WEBS-35C3 incorporate Intel® newest desktop processor technology and Portwell's innovative PCI/PCIe expansion modularization design to construct a reliable and versatile embedded system. Using Intel® 6<sup>th</sup> generation processor with integrated Gen 9 graphic, the WEBS-35C3 provides nearly double graphics performance over its predecessor. This platform natively supports new features such as USB 3.0, SATA3 and DDR4 2133/1866.

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 & value-optimized Performance Platforms

Instead of adopting a mobile CPU like a traditional embedded system, WEBS-35C3 utilizes a 35W Intel® desktop CPU and Intel® Q170 chipset, which is more economical compared to its mobile counterpart and provides great efficacy as well as low power consumption; this makes WEBS-35C3 not only competitive but outstanding in the market. The system further takes advantage of the Intel® Core™ processor technologies supporting dual channel DDR4 memory up to 32GB.



### (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-35C3 expansion version. By creating an isolated chamber to accommodate add-on card separately, WEBS-35C3 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-35C3 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.



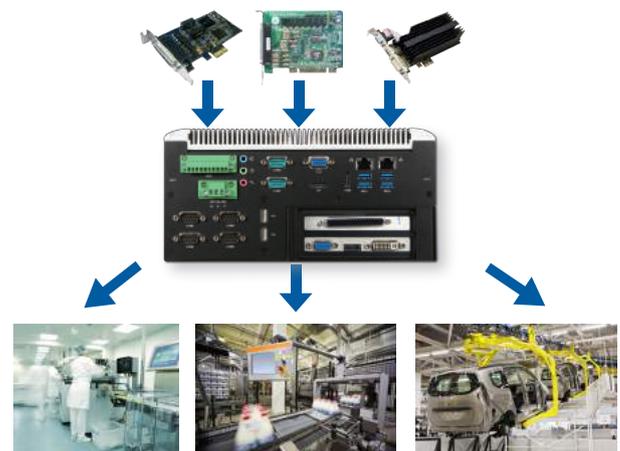
## Product Feature

WEBS-35C3 is easy installation and maintenance. With improving chassis design, user can replace memory, CPU, mini-PCIe module and M.2 module on their demand by just removing top cover.

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, two USB2.0, four USB3.0, one 8 bits GPIO port and Mic-in/Line-in/Line-out.

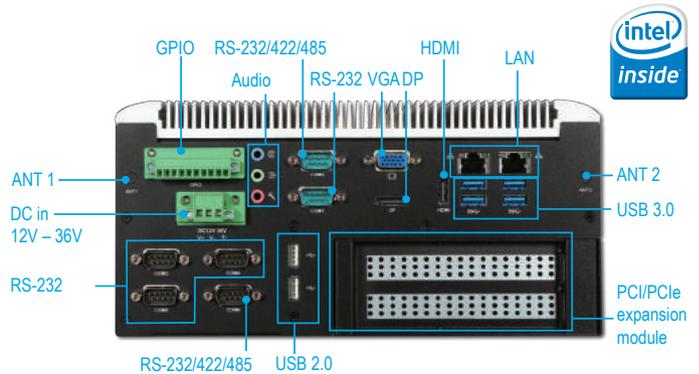
Optional wireless, 3G and LTE module can be added via a Mini-PCIe socket or M.2 socket and additional function can be added via two PCIe x4 or one PCIe x4 + one PCI or two PCIe x16 expansion slot.

The WEBS-35C3 serves performance and graphic demanding application targeted at factory automation and industrial automation, which requires additional control feature via expansion slots.



# WEBS-35C3

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



The WEBS-35C3 builds on Intel® desktop Q170 chipset and takes advantages of Intel® Core™ i3/i5/i7 desktop processor technologies that can support dual DDR4 memory. Support two Gigabit Ethernet ports, different add-on card expansion options, one M.2 socket and one Mini-PCIe socket. The WEBS-35C3 is an ideal platform with rich I/O and high resolution for POS, kiosk, digital signage, and surveillance security monitoring applications.

## FEATURES

- Intel® Core™ i High performance Fan-less Embedded Box PC
- 6<sup>th</sup> generation Intel® Skylake-S Core™ i3/i5/i7 Desktop processor (Quad-Core CPU supported)
- Dual UB-DIMM DDR4 up to 32GB
- 2x 2.5" SATA HDD/SSD, 1x mSATA
- Rich I/O is good for versatile applications
- 1x M.2 socket, 1x Full-size Mini-PCIe socket
- Different add-on card expansion options
- Innovative PCI/PCIe expansion module is easy for add-on cards installation and replacement
- Rugged design is good for using in harsh environment

## ORDERING GUIDE

AS5-3459	(R).ATO.WEBS-35C3. (x4 type) Embedded rugged fan-less system with Intel Skylake-S Core i3/i5/i7 based MINI-ITX system.
AS5-3463	(R).ATO.WEBS-35C3. (x16 type). Embedded rugged fan-less system with Intel Skylake-S Core i3/i5/i7 based MINI-ITX system.

## System

M/B	WADE-8017
System Chipset	Intel® Q170
CPU	- Intel® Core™ i7-6700TE, 2.4GHz, 8M L2 Cache, up to 3.40 GHz, 35W TDP (4C/8T) - Intel® Core™ i5-6500TE, 2.3GHz, 4M L2 Cache, up to 3.30 GHz, 35W TDP (4C/4T) - Intel® Core™ i3-6100TE, 2.7GHz, 4M L2 Cache, 35W TDP (2C/4T) - Intel® Pentium® G4400TE, 2.9GHz, 3M L2 Cache, 35W TDP (2C/2T) - Intel® Celeron® G3900TE, 2.3GHz, 2M L2 Cache, 35W TDP (2C/2T)
BIOS	AMI uEFI BIOS (SPI ROM)
Memory	Dual 260-pin UB-DIMM socket supports DDR4 2133/1866 Non-ECC up to 32GB
Storage	2x 2.5" SATA HDD/SSD, 1x mSATA (via mini-PCIe socket)
Watchdog Timer	Programmable via S/W from 1 sec. to 255 sec.
H/W Status Monitor	- Temperature (CPU & System) - Speed (CPU Fan & System Fan) - Voltage (CPU Vcore, 12V, 5V, 3.3V, VDIMM)
Expansion	- 1x M.2 socket (Type E) with PCIe1, USB2.0, SDIO, UART, or I2C signal - Expansion slot option: 2x PCIe x16 slot (PCIe x8 Signal) 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 USB 3.0, 2x USB 2.0
Audio	Line-in/Line-out/Mic-in (ALC892)
Ethernet	2x Gigabit Ethernet (Intel® I219LM and Intel® I211AT)
GPIO	1x Programmable 8-bit Digital I/O
Other	- 2x Antenna hole for WiFi, 3G/GPS or 4G LTE module - 1x EXT Power Switch

## Power Supply Unit

Power Input	DC 12V ~ 36V with 3-pin Terminal block Connector
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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 60068-2-6
Operation Shock	50G, 11 msec, IEC 60068-2-27

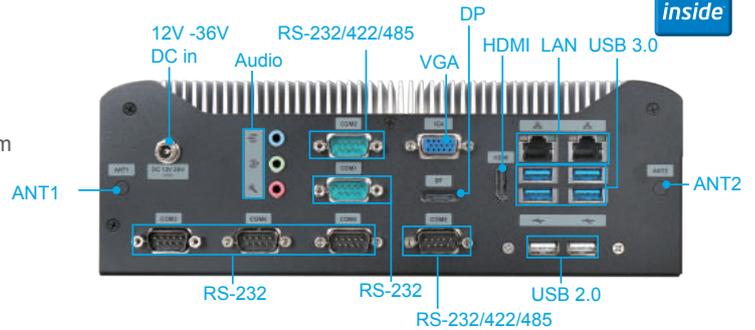
## Mechanical

Dimension	253(W) x 201(D) x 123(H) mm
Weight	7kg
Mounting	Wall 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

- 4<sup>th</sup> 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 USB 3.0, 2x USB 2.0, 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
AS5-3437	(R).ATO.WEBS-3581-TBC.WADE-8015. Mini-ITX System.

## System

M/B	WADE-8015
System Chipset	Intel® DH82Q87
CPU	- 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	- 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 USB 3.0, 2x USB 2.0
Audio	Line-in/Line-out/Mic-in (ALC886)
Ethernet	2x Gigabit Ethernet (Intel® WGI217LM + WGI210AT)
GPIO	1x Programmable 8-bit Digital I/O
Other	- 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 60068-2-6
Operation Shock	50G, 11 msec, IEC 60068-2-27

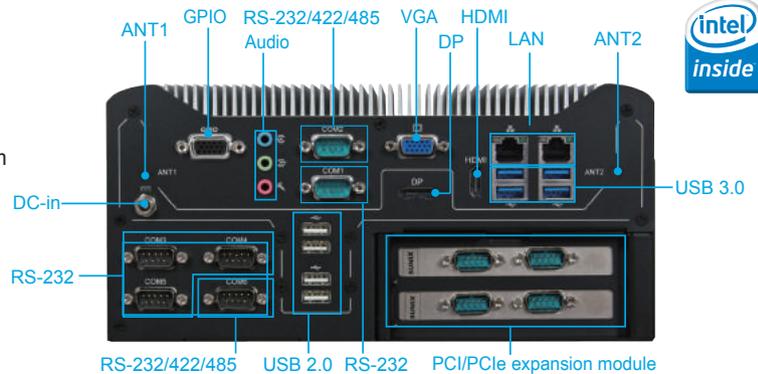
## Mechanical

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



# 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

- 4<sup>th</sup> 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 USB 3.0, 4x USB 2.0, 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
AS5-3446	(R).ATO.WEBS-3583-E.Mini-ITX System. (Expansion Enhancement)

## System

M/B	WADE-8015
System Chipset	Intel® DH82Q87
CPU	- 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	- Temperature (CPU & System) - Voltage (CPU Vcore, VBAT, 5VSB, 12V, 5V, 3.3V)
Expansion	- 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 USB 3.0, 4x USB 2.0
Audio	Line-in/Line-out/Mic-in (ALC886)
Ethernet	2x Gigabit Ethernet (Intel® WG1217LM + WG1210AT)
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 ~ 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 60068-2-6
Operation Shock	50G, 11 msec, IEC 60068-2-27

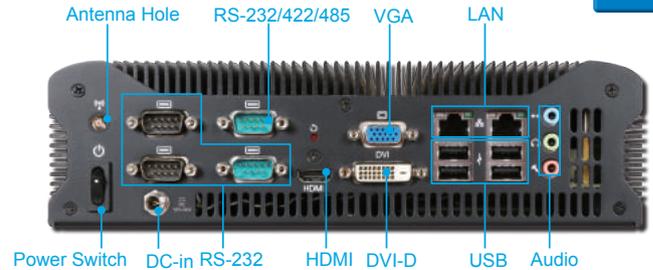
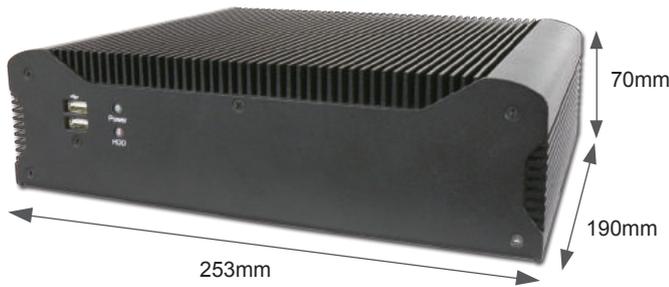
## Mechanical

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



# 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-PCIe 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-PCIe 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

M/B	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-PCIe 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 USB 2.0 (Front), 4x USB 2.0 (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

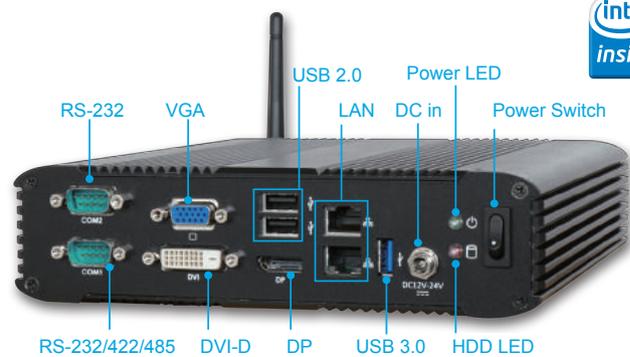
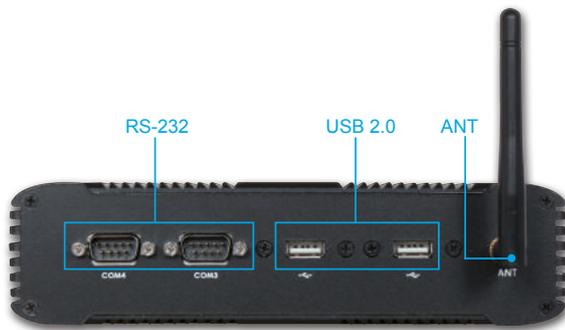
Power Input	DC 12V ~ 36V
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## Environmental

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 60068-2-6
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



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 USB 3.0, 3x USB 2.0, 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 USB 3.0, 4x USB 2.0
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 60068-2-6
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-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
- Fan-less and cable-less design with wide temperature support (-30°C ~ 70°C 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
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## 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-PCle socket (USB+PCIe) - 2x RS-232/422/485, 1x RS-232 (Expansion: Option 1) - 1x Line-out, 1x RS-232/422/485, 2x USB 2.0 (Expansion: Option 2)

## External I/O

Serial Port	2x RS-232/422/485 (Expansion: Default)
Display	1x DVI-I
USB	1x USB 3.0, 1x USB 2.0, 2x USB 2.0 (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
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## 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 60068-2-6
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-548x Series

## Product Introduction

The WEBS-548x series Fan-less 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 4<sup>th</sup> 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-548x 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-548x series is the ideal Fan-less 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 4<sup>th</sup> generation Intel® Core™ enable greater integration into mobile 2-in-1 system designs, the new 4<sup>th</sup> 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"> <li>• CPU and PCH Integrated into single BGA package</li> <li>• 15W &amp; 28W TDPs, 6W and below SDP</li> <li>• Supports LPDDR3 and DDR3L memory</li> </ul>	 <ul style="list-style-type: none"> <li>• 2 chip scalable solution: CPU and chipset</li> <li>• BGA and rPGA packages</li> <li>• 57W, 47W, and 37W TDPs</li> <li>• Supports DDR3L Memory</li> <li>• GT3e graphics</li> </ul>

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

The WEBS-548x 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 USB 3.0, 2x USB 2.0, 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.



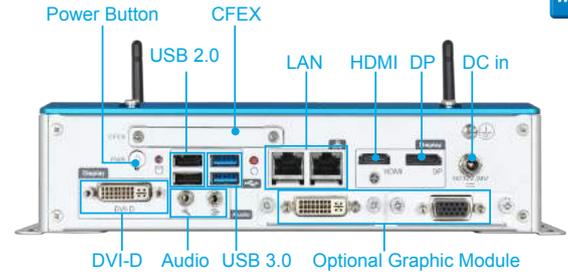
### (3) 5 Display Output is Available

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™ 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-PCIe 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-PCIe socket can be used in a diversity of applications
- 1x RS-232/422/485, 1x RS-232, 2x USB 3.0, 2x USB 2.0, 2x Gigabit Ethernet Port
- 5 Display by VGA/HDMI/DP + Optional Graphic Module
- 2x Antenna hole + 1x on board 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-PCIe socket (USB+PCIe) + SIM Card holder - 1x Half-size Mini-PCIe socket (mSATA+PCIe)

## 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 USB 3.0, 2x USB 2.0
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 60068-2-6
Operation Shock	50G, 11 msec, IEC 60068-2-27

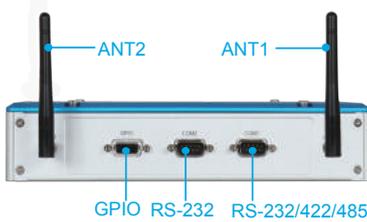
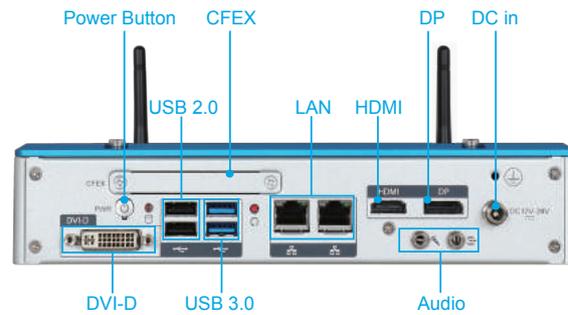
## Mechanical

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™ 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-PCIe 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 CFEF, 1x mSATA
- 2x Mini-PCIe socket can be used in a diversity of applications
- 1x RS-232/422/485, 1x RS-232, 2x USB 3.0, 2x USB 2.0, 2x Gigabit Ethernet Port
- Triple Display by VGA/HDMI/DP
- 2x Antenna hole + 1x on board 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.Mini-ITX 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 socket supports DDR3L 1333/1600 up to 16 GB
Storage	1x 2.5" SATA HDD/SSD, 1x CFEF, 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-PCIe socket (USB+PCIe) + SIM Card holder - 1x Half-size Mini-PCIe socket (mSATA+PCIe)

## 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 USB 3.0, 2x USB 2.0
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 60068-2-6
Operation Shock	50G, 11 msec, IEC 60068-2-27

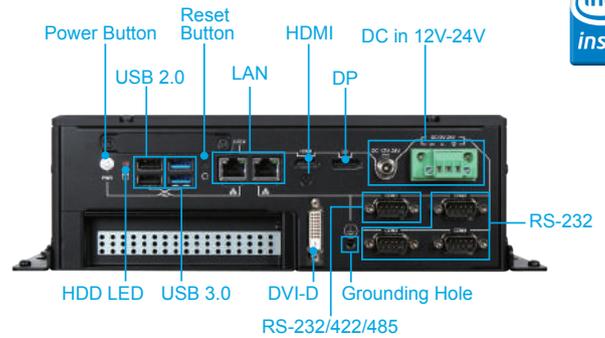
## Mechanical

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-PCIe 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

- 4<sup>th</sup> 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-PCIe 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 USB 3.0, 2x USB 2.0, 2x Gigabit Ethernet Port
- Triple Display by DVI-D/HDMI/DP
- 2x Antenna hole + 1x on board 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

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 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-PCIe socket (USB+PCIe) + SIM Card holder - 1x Half-size Mini-PCIe socket (mSATA+PCIe) - 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 USB 3.0, 2x USB 2.0
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 60068-2-6
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 Mounting Solution

## Wall Mount Kit



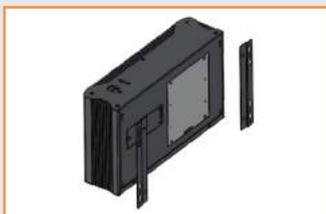
### WEBS-2170/2190/21A0/21B0

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



### WEBS-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

## DIN Mount Kit



### WEBS-2170/2190/21A0/21B0

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)

## Panel Mount Kit



### WEBS-2170/2190/21A0/21B0

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



### WEBS-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

### 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)

# RICH-33B0-8171

Embedded Rugged Fan-less System  
with Intel® Celeron® Processor based  
Mini-ITX Board



The RICH-33B0-8171 builds on Intel® Celeron® Processor N3150, that can support dual channel DDR3L memory, support dual Gigabit Ethernet ports, one mSATA socket and one Mini-PCle socket. The RICH-33B0-8171 is ideal platform with rich I/O and high resolution for automation, POS, kiosk and digital signage applications.

## FEATURES

- Fan-less system
- Intel® Celeron® Processor N3150 support
- Dual channel SO-DIMM socket up to 8G DDR3L memory
- 1x mSATA, 1x 2.5" SATA HDD/SSD (Option)
- 3x RS-232/422/485, 3x RS-232, 4x USB 3.0, 4x USB 2.0
- Dual Gigabit Ethernet Ports

## ORDERING GUIDE

AS5-3447	(R).RICH-33B0-8171 Full. w/COMx6/USBx8/Dual LAN/PS2/Audio
AS5-3452	(R).RICH-33B0-8171-TBC. w/Ex.PSW/COMx6/USBx8/Dual LAN/PS2/Audio

## System

M/B	WADE-8171
CPU	Intel® Celeron® Processor N3150
BIOS	AMI uEFI BIOS
Memory	Dual 204 pin SO-DIMM socket supports DD3L Memory up to 8GB
Storage	1x mSATA socket, 1x 2.5" HDD/SSD (Option)
Watchdog Timer	Programmable via S/W from 1 sec. to 255 sec.
H/W Status Monitor	Temperature (CPU & System)
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	6 x COM (3x RS-232/42/485, 3x RS-232)
Display	1x VGA, 1x HDMI
USB	4x USB 3.0 (Rear), 4x USB 2.0 (Front)
Audio	Line-in/ Line-out
Ethernet	2x Gigabit Ethernet
GPIO	N/A
Other	1x Antenna hole for WiFi or 3G/GPS module

## Power Supply Unit

Power Input	DC 12V ~ 24V
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## Environmental

Operation Temperature	0°C ~ 50°C
Storage Temperature	-20°C ~ 80°C
Relative Humidity	95%@40°C, non-condensing
Operation Vibration	5Grms/10-500Hz, IEC 60068-2-6
Operation Shock	50G, 11 msec, IEC 60068-2-27

## Mechanical

Dimension	200 x 200 x 45 (mm)
Weight	2 kg
Mounting	Wall mounting



# RICH-33B0-8171-S

Embedded Rugged Fan-less System  
with Intel® Celeron® Processor based  
Mini-ITX Board



The RICH-33B0-8171-S builds on Intel® Celeron® Processor N3150, that can support dual channel DDR3L memory, support dual Gigabit Ethernet ports, one mSATA socket and one Mini-PCIe socket. The RICH-33B0-8171-S is ideal platform with rich I/O and high resolution for automation, POS, kiosk and digital signage applications.

## FEATURES

- Fan-less system
- Intel® Celeron® Processor N3150 support
- Dual channel SO-DIMM socket up to 8G DDR3L memory
- 1x mSATA, 1x 2.5" SATA HDD/SSD (Option)
- 3x RS-232/422/485, 4x USB 3.0
- Dual Gigabit Ethernet Ports

## ORDERING GUIDE

AS5-3445	(R).RICH-33B0-8171 Standard. w/COMx3/USBx4/Dual LAN/PS2/Audio
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## System

M/B	WADE-8171
CPU	Intel® Celeron® Processor N3150
BIOS	AMI uEFI BIOS
Memory	Dual 204 pin SO-DIMM socket supports DD3L Memory up to 8GB
Storage	1x mSATA socket, 1x 2.5" HDD/SSD (Option)
Watchdog Timer	Programmable via S/W from 1 sec. to 255 sec.
H/W Status Monitor	Temperature (CPU & System)
Expansion	- 1x Full-size Mini-PCIe socket (USB+PCIe) + SIM Card holder - 1x Half-size Mini-PCIe socket (mSATA+PCIe) - 1x PCIe x4 slot (PCIe x1 signal)

## External I/O

Serial Port	3 x COM (3x RS-232/42/485)
Display	1x VGA, 1x HDMI
USB	4x USB 3.0 (Rear)
Audio	Line-in/ Line-out
Ethernet	2x Gigabit Ethernet
GPIO	N/A
Other	1x Antenna hole for WiFi or 3G/GPS module

## Power Supply Unit

Power Input	DC 12V ~ 24V
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## Environmental

Operation Temperature	0°C ~ 50°C
Storage Temperature	-20°C ~ 80°C
Relative Humidity	95%@40°C, non-condensing
Operation Vibration	5Grms/10-500Hz, IEC 60068-2-6
Operation Shock	50G, 11 msec, IEC 60068-2-27

## Mechanical

Dimension	200 x 200 x 45 (mm)
Weight	2 kg
Mounting	Wall mounting



# Design Concept for CHUMPI Series

## Product Introduction

Powered by Intel® Atom™ platform, Bay Trail-I SoC processor E3845, which provides extended temperature and high I/O connectivity within 10W thermal design power (TDP), CHUMPI Series is an ideal platform for applications requesting for highly energy-efficient, yet powerful computing platform and graphic processing power.



\* Rich I/O of CHUMPI-5390

Featuring brand new expansion design, CHUMPI Series makes a new type of industrial embedded system. It not only features all required interfaces for industrial applications, but also equips I/O interfaces that can be expanded via proprietary slot and extension I/O kits. With these special hardware structure, CHUMPI embedded system's high flexibility and expandability can catch customers' eye at the first sight.

## Product Highlight

### (1) Wide Operating Temperature Support with Fan-less Design

Only the best components go into the system and board design in CHUMPI Series. By taking advantage of Intel® Atom™ E3800 family, which features extended temperature support, CHUMPI embedded system can be operated under extremely hot and cold conditions. Compared to most embedded systems in the market, the operating temperature of CHUMPI Series can range from -30°C or up to 70°C in spite of its fan-less design. Following thorough and rigorous design principle, the system structure optimizes the thermal dissipation as well as ensures durability and reliability in harsh environments.

### (2) Highly Flexible I/O and Expandable Capabilities

It's always a good strategy to keep the system as flexible as possible in order to serve various customers from different applications. As a result, CHUMPI embedded system features impressive combination of modern and legacy I/O connectivity with dual LAN, four COM, four USB, 8-bit programmable DIO and extra display support via VGA and HDMI. In addition, one proprietary expansion slot and more than six extension I/O kits allows enhancing I/O connectivity and increasing system functionality via various add-on modules.

### (3) An Ideal System Solution Aiming at Industrial Market

CHUMPI Series features fan-less and rugged design and has proven itself an ideal solution for industrial environment. For example, 2KV optical isolated COM ports help preventing damage caused by surges and ground loops commonly found in industrial environment. Except hardware focus, industrial protocols are also made available with CHUMPI Series' highly flexible and expandable design. Last but not least, product reliability and stability are certified by industrial product quality tests including anti-vibration (continuous vibrations) of up to 5Grms/10~500Hz, and anti-shock of up to 50G, 11msec.

## Flexibe I/O Expansion

Option 1 -4IC  
1x Isolation 2KV RS-232/422/485  
3x Isolation 2KV RS-232

Option 2 -2IC4U  
1x Isolation 2KV RS-232/422/485  
1x Isolation 2KV RS-232  
4 x USB 2.0

Option 6 -API  
1 x Line-out  
1 x MIC  
2 x Profinet

Option 5 -AIE  
1 x Line-out  
1 x MIC  
2 x EtherCAT

Option 4 -ACAN  
1 x Line-out  
1 x MIC  
2 x CAN

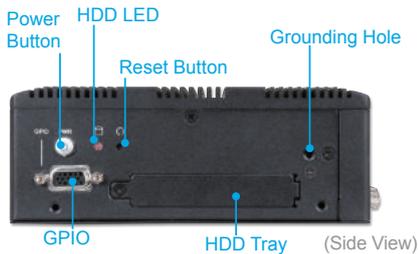
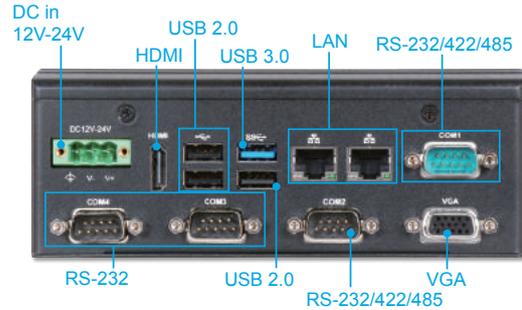
Option 3 -A  
1 x Line-out, 1 x MIC,  
1 x Full-size Mini-PCIe  
socket with SIM Card  
Holder

\* High Expandability of CHUMPI-5391



# CHUMPI-5390

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



The CHUMPI-5390 is powered by Intel® Atom™ quad-core processor. Despite its fan-less and cable-less design, the system can support wide temperature ranging from  $-30^{\circ}\text{C}$  ~  $70^{\circ}\text{C}$  degrees. By utilizing the low power technology, CHUMPI-5390 is an ideal platform for factory automation and transportation applications.

## FEATURES

- Intel® Atom™ embedded processor with low power and quad-core technology
- Fan-less and cable-less design with wide temperature support ( $-30^{\circ}\text{C}$  ~  $70^{\circ}\text{C}$  degrees)
- One SO-DIMM socket up to 8GB DDR3L Memory
- 1x 2.5" SATA HDD/SSD, 1x Half-size mSATA socket
- 2x Gigabit Ethernet, 1x USB 3.0, 3x USB 2.0, 2x RS-232
- 1x VGA, 1x HDMI
- 2x RS-232/422/485 (Autoflow support), 2 x RS-232
- Support wide DC 12V ~24V input
- 2x Antenna hole for WiFi, 3G/GPS or 4G LTE module to use
- Wall mounting
- OP Vibration: 5Grms/10~500Hz
- OP Shock: 50G, 11msec
- IP40 Rating

## ORDERING GUIDE

AS5-3462	(R).ATO. Chumpi-5390. Intel Bay Trail Atom E3845 Embedded System
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## System

M/B	PAB-1001-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 Half-size mSATA
Watchdog Timer	Programmable via S/W from 1 sec. to 255 sec
Hardware Monitoring	- Temperature (CPU & System) - Voltage (CPU Vcore, 12V, 5V, 3.3V, VDIMM)
Expansion Interface	1x Full-size Mini-PCIe socket

## External I/O

Serial Port	4x COM port (2x RS-232/422/485 selectable by BIOS)
Display	1x VGA, 1x HDMI
USB	1x USB 3.0, 3x USB 2.0
Audio	N/A
Ethernet	2x Gigabit Ethernet (Intel® I210IT)
GPIO	1x Programmable 8-bit Digital I/O
Other	2x Antenna hole for WiFi, 3G/GPS or 4G LTE module

## Power Supply Unit

Power Input	DC 12V ~ 24V
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## Environmental

Operation Temperature	$-30^{\circ}\text{C}$ ~ $70^{\circ}\text{C}$
Storage Temperature	$-40^{\circ}\text{C}$ ~ $80^{\circ}\text{C}$
Relative Humidity	95%@ $40^{\circ}\text{C}$ , non-condensing
Operation Vibration	5Grms/10-500Hz, IEC 60068-2-6
Operation Shock	50G, 11 msec, IEC 60068-2-27

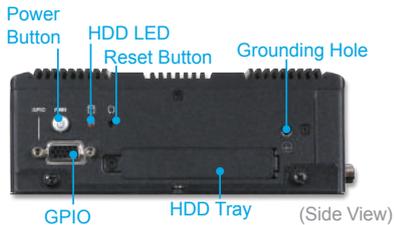
## Mechanical

Dimension	160(W) x 160(D) x 60(H) mm
Weight	2kg
Mounting	Wall mounting



# CHUMPI-5391

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



The CHUMPI-5390 is powered by Intel® Atom™ quad-core processor. Despite its Fan-less and cable-less design, the system can support wide temperature ranging from -30°C ~ 70°C degrees. By utilizing the low power technology, CHUMPI-5390 is an ideal platform for factory automation and transportation applications.

## FEATURES

- Intel® Atom™ embedded processor with low power and quad-core technology
- Fan-less and cable-less design with wide temperature support (-30°C ~ 70°C degrees)
- One SO-DIMM socket up to 8GB DDR3L Memory
- 1x 2.5" SATA HDD/SSD, 1x Half-size mSATA socket
- 2x Gigabit Ethernet, 1x USB 3.0, 3x USB 2.0
- 1x VGA, 1x HDMI
- 2x RS-232/422/485 (Autoflow support), 2 x RS-232
- Support wide DC 12V ~ 24V input
- 3x Antenna hole for WiFi, 3G/GPS or 4G LTE module to use
- Wall mounting
- OP Vibration: 5Grms/10~500Hz
- OP Shock: 50G, 11msec
- IP40 Rating

## ORDERING GUIDE

AS5-3461	(R).ATO. Chumpi-5391 Series. Intel Bay Trail Atom E3845 Embedded System
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## System

M/B	PAB-1001-E3845
System Chipset	Intel® Baytrail SoC
CPU	Intel® Atom™ E3845, 2M L2 Cache, 1.91GHz, 10W TDP (4C/4T)
BIOS	AMI uFEI 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 Half-size mSATA
Watchdog Timer	Programmable via S/W from 1 sec. to 255 sec.
Hardware Monitoring	- Temperature (CPU & System) - Voltage (CPU Vcore, 12V, 5V, 3.3V, VDIMM)
Expansion Interface	- 1x Full-size Mini-PCIe socket (Basic) - 1x Isolation 2KV RS-232/422/485, 3x Isolation 2KV RS-232 (Option 1) - 1x Isolation 2KV RS-232/422/485, 1x Isolation 2KV RS-232, 4x USB2.0 (Option 2) - 1x Line-out, 1x MIC, 1x Full-size Mini-PCIe socket + SIM card Holder (Option 3) - 1x Line-out, 1x MIC, 2x CAN (Option 4) - 1x Line-out, 1x MIC, 2x EtherCAT (Option 5) - 1x Line-out, 1x MIC, 2x Profinet (Option 6)

## External I/O

Serial Port	4x COM port (2x RS-232/422/485 selectable by BIOS)
Display	1x VGA, 1x HDMI
USB	1x USB 3.0, 3x USB 2.0
Audio	Realtek ALC892-GR HD Audio Codec
Ethernet	2x Gigabit Ethernet (Intel® I210IT)
GPIO	1x Programmable 8-bit Digital I/O
Other	3x Antenna hole for WiFi, 3G/GPS or 4G LTE 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 60068-2-6
Operation Shock	50G, 11 msec, IEC 60068-2-27

## Mechanical

Dimension	247(W) x 160(D) x 60(H) mm
Weight	2.4kg
Mounting	Wall mounting



## ▾ 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
45	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					
46	4U	RPC-500NC/L-MX	ATX	RPC-500NC-MX RPC-500L-MX RPC-500NC-MX/B					
47	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					
48	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
49	3U	AREMO-3194	ATX	AREMO-3194-MX AREMO-3194-MX/B AREMO-3194E-MX AREMO-3194E-MX/B					
51	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	
53	2U	AREMO-2173MX	uATX						
55	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
57	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
59	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
61	Node	AREMO-4184	12	AREMO-4184/B	(Same as AREMO-6182)				



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

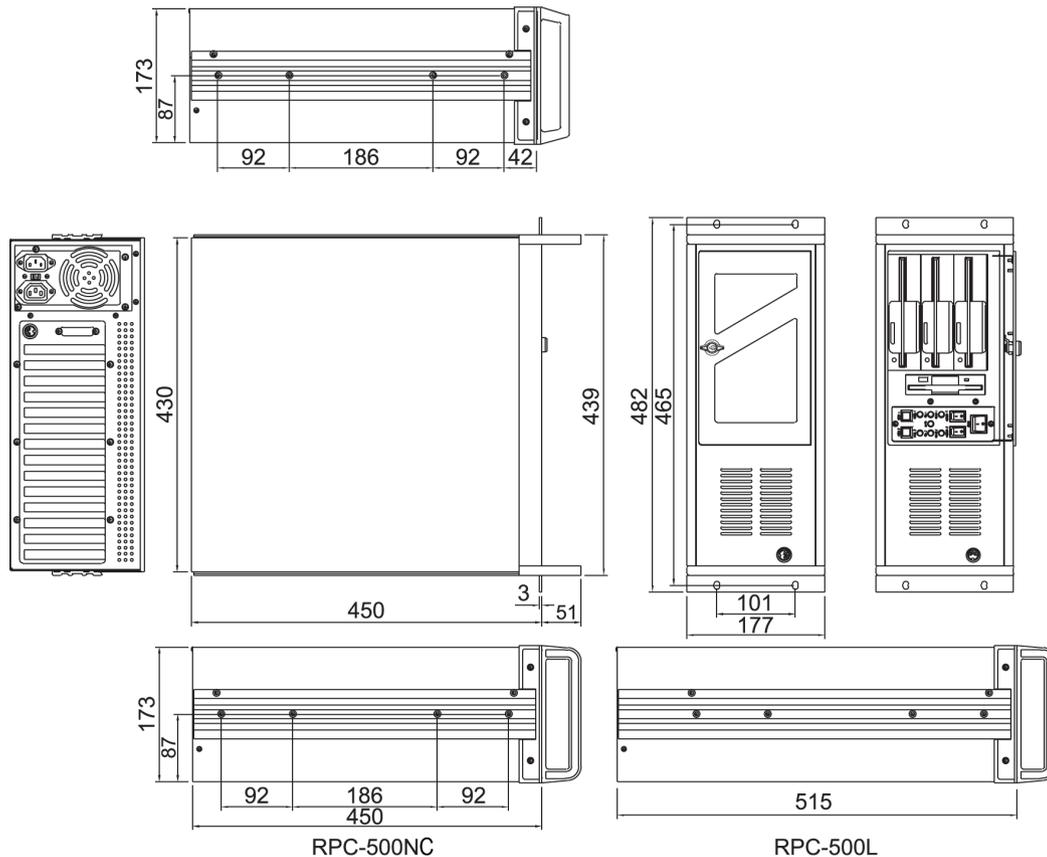
Maximum output	350W active PFC
Output Voltage & Current	+5V@12A; +12V1@18A; +12V2@18A; +3.3V@18A; -12V@0.3A, +5Vsb@2.5A
Input Voltage	90V ~ 264V AC, full range
Input Frequency	50 ~ 60Hz
Input Current	8A@115V, 8A@230V
Efficiency	> 80%
MTBF	100,000 hrs
EMI & Safety Approval	UL, TUV, CE, FCC, CB, VCCI, 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
<ul style="list-style-type: none"> <li>■ A lockable front door with thumb lock</li> </ul>	<ul style="list-style-type: none"> <li>■ Good for dust-proof &amp; Running status visible</li> </ul>
<ul style="list-style-type: none"> <li>■ One power on/off switch with LED indicator, one reset and one K/B lock switches inside the lockable door</li> </ul>	<ul style="list-style-type: none"> <li>■ Avoid accidental reset for better running security</li> </ul>
<ul style="list-style-type: none"> <li>■ Front replaceable air filter</li> </ul>	<ul style="list-style-type: none"> <li>■ For installing dual systems and redundant power supplies more easily</li> </ul>
<ul style="list-style-type: none"> <li>■ Two USB ports on the front panel</li> </ul>	<ul style="list-style-type: none"> <li>■ For easy access</li> </ul>
<ul style="list-style-type: none"> <li>■ One PS/2 K/B connector on the front panel</li> </ul>	<ul style="list-style-type: none"> <li>■ Convenient to connect to the keyboard</li> </ul>
<ul style="list-style-type: none"> <li>■ One K/B connector cap</li> </ul>	<ul style="list-style-type: none"> <li>■ Good for dust-proof for the front accessible K/B connector</li> </ul>
<ul style="list-style-type: none"> <li>■ Two ball-bearing cooling fans</li> </ul>	<ul style="list-style-type: none"> <li>■ Better ventilation to provide the system with higher reliability</li> </ul>
<ul style="list-style-type: none"> <li>■ Enhanced drive bracket to hold 3 x 5.25" + 1 x 3.5" (external) and 1 x 3.5" drives (internal)</li> </ul>	<ul style="list-style-type: none"> <li>■ For integrating varied systems with higher flexibility</li> </ul>
<ul style="list-style-type: none"> <li>■ Shock-resistant cushion for the drive bracket</li> </ul>	<ul style="list-style-type: none"> <li>■ Suitable for installing RAID and CD-ROM drive</li> </ul>
<ul style="list-style-type: none"> <li>■ Two adjustable positions for hold-down card retainers</li> </ul>	<ul style="list-style-type: none"> <li>■ For fixing all the cards more flexibly and tightly</li> </ul>
<ul style="list-style-type: none"> <li>■ Changeable modularized back panel for 14-slot ISA/PICMG backplane or ATX M/B</li> </ul>	<ul style="list-style-type: none"> <li>■ Only one minutes to change the back panel</li> <li>■ Easy to change to different backplanes and keep stock</li> </ul>
<ul style="list-style-type: none"> <li>■ Field replaceable power supply bracket for both normal PS/2 power supply and PS/2 type redundant power supply</li> </ul>	<ul style="list-style-type: none"> <li>■ Only three minutes to change defective power supply</li> <li>■ Only 30 seconds to change the defective PSU module</li> </ul>

## MECHANICAL DRAWING



# 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

# AREMO-4196

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

FEATURE	BENEFITS
<ul style="list-style-type: none"> <li>■ A lockable front door with thumb lock</li> </ul>	<ul style="list-style-type: none"> <li>■ Good for dust-proof &amp; security</li> </ul>
<ul style="list-style-type: none"> <li>■ One power on/off switch and one system reset button on the front panel behind the lockable door</li> </ul>	<ul style="list-style-type: none"> <li>■ Avoid accidental reset for better running security</li> </ul>
<ul style="list-style-type: none"> <li>■ Fan control board</li> </ul>	<ul style="list-style-type: none"> <li>■ Detect fan fail and Alarm</li> </ul>
<ul style="list-style-type: none"> <li>■ Front replaceable air filter</li> </ul>	<ul style="list-style-type: none"> <li>■ For easy cleaning and install</li> </ul>
<ul style="list-style-type: none"> <li>■ Equipped two USB ports</li> </ul>	<ul style="list-style-type: none"> <li>■ Efficient Access</li> </ul>
<ul style="list-style-type: none"> <li>■ Dual 12cm ball-bearing cooling fans</li> </ul>	<ul style="list-style-type: none"> <li>■ Better ventilation to provide the system with higher reliability</li> </ul>
<ul style="list-style-type: none"> <li>■ Enhanced drive bracket to hold three 5.25" and two 3.5" HDD drives (internal)</li> </ul>	<ul style="list-style-type: none"> <li>■ For integrating varied systems with higher flexibility</li> <li>■ Suitable for installing RAID and CD-ROM drive</li> </ul>
<ul style="list-style-type: none"> <li>■ Shock-resistant cushion for the drive bracket</li> </ul>	<ul style="list-style-type: none"> <li>■ Suitable for harsh industrial environment</li> </ul>
<ul style="list-style-type: none"> <li>■ Two adjustable positions for hold-down card retainers</li> </ul>	<ul style="list-style-type: none"> <li>■ For fixing all the cards more flexibly and tightly</li> </ul>
<ul style="list-style-type: none"> <li>■ Changeable modularized back panel for 14-slot ISA/PICMG backplane or ATX motherboard</li> </ul>	<ul style="list-style-type: none"> <li>■ Only one minute to change the back panel</li> <li>■ Easy to change to different backplanes and keep stock</li> </ul>
<ul style="list-style-type: none"> <li>■ Field replaceable power supply bracket for both normal PS/2 power supply and PS/2 type redundant power supply</li> </ul>	<ul style="list-style-type: none"> <li>■ Only three minutes to change the defective power supply</li> <li>■ Only thirty seconds to change the defective PSU module</li> </ul>

## REFINEMENT



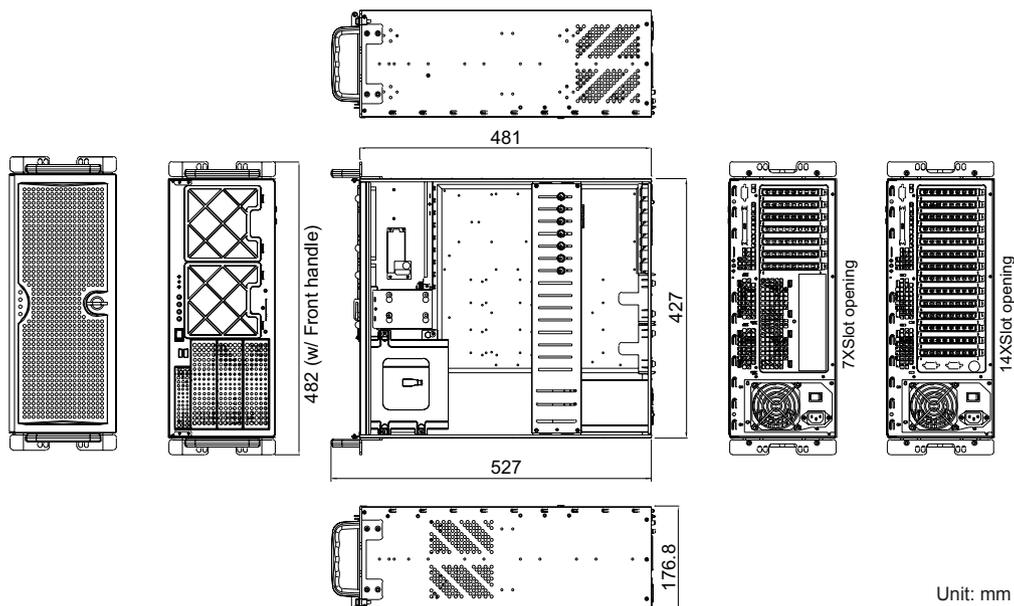
AREMO-4196



AREMO-4196-MX



## MECHANICAL DRAWING





AREMO-3194-MX and AREMO-3194E-MX is designed for ATX form factor motherboard 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
<ul style="list-style-type: none"> <li>350W Active PFC power supply</li> </ul>	<ul style="list-style-type: none"> <li>Sufficient power source for Intel® Desktop Platform</li> </ul>
<ul style="list-style-type: none"> <li>Cooling tunnel design</li> </ul>	<ul style="list-style-type: none"> <li>Better ventilation to enhance system reliability</li> </ul>
<ul style="list-style-type: none"> <li>More expansion slots</li> </ul>	<ul style="list-style-type: none"> <li>Support up to six expansion and one AGP slots for higher expansibility</li> </ul>
<ul style="list-style-type: none"> <li>Two USB and one IEEE 1394 ports on the front panel</li> </ul>	<ul style="list-style-type: none"> <li>Easy to operate the system</li> </ul>
<ul style="list-style-type: none"> <li>Lockable front door</li> </ul>	<ul style="list-style-type: none"> <li>Provide better security</li> </ul>
<ul style="list-style-type: none"> <li>Front replaceable air filters</li> </ul>	<ul style="list-style-type: none"> <li>For easy cleaning</li> </ul>

## 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

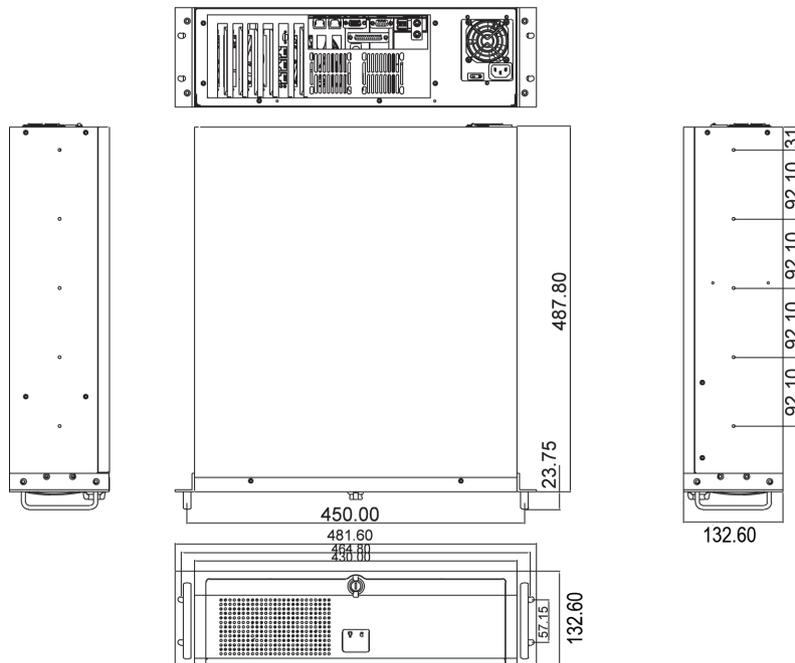
Avoid abnormal operation and increase system reliability



### 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 1.3 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 8 $\Omega$ 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)] PCIMG 1.3 backplane PBPE-06V3: 6-slot [PCIe (2), PCI (3), PCI-X (0)] PCIMG 1.3 backplane PBPE-06V: 6-slot [PCIe (5)] PCIMG 1.3 backplane PBPE-06V4: 6-slot [PCI (4), PCI-X (0)] PCIMG 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
<ul style="list-style-type: none"> <li>350W Active PFC power supply</li> </ul>	<ul style="list-style-type: none"> <li>Sufficient power source for Intel® Desktop Platform</li> </ul>
<ul style="list-style-type: none"> <li>Two 7cm high speed fans</li> </ul>	<ul style="list-style-type: none"> <li>Better ventilation to enhance system reliability</li> </ul>
<ul style="list-style-type: none"> <li>Two swappable SATA HDD drive bays</li> </ul>	<ul style="list-style-type: none"> <li>Easy to access HDD drives</li> </ul>
<ul style="list-style-type: none"> <li>Up to 5 PCI expansion slots</li> </ul>	<ul style="list-style-type: none"> <li>For system function expansion</li> </ul>
<ul style="list-style-type: none"> <li>Front replaceable air filters</li> </ul>	<ul style="list-style-type: none"> <li>Easy cleaning</li> </ul>

## REFINEMENT



**Thumb Lock**  
Convenient to operate or protect the system



**Two Swappable SATA HDD Drives**  
Easy to access HDD drives

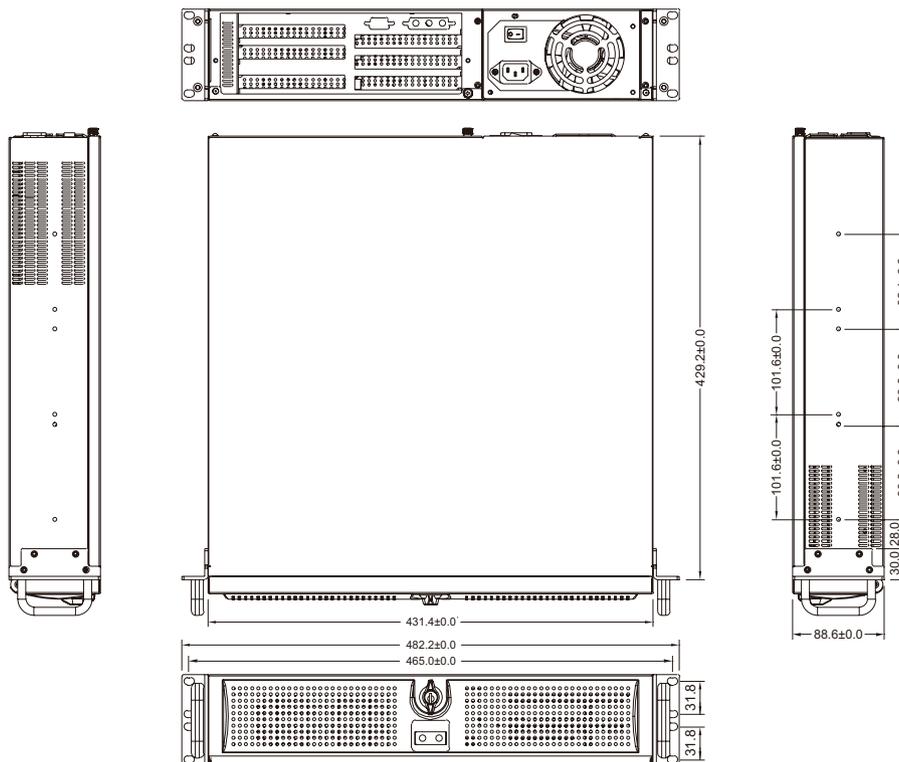


**Front Replaceable Air Filters/Fans**  
Convenient to change air filters or fans when needed



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 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)

## 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 mother board

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

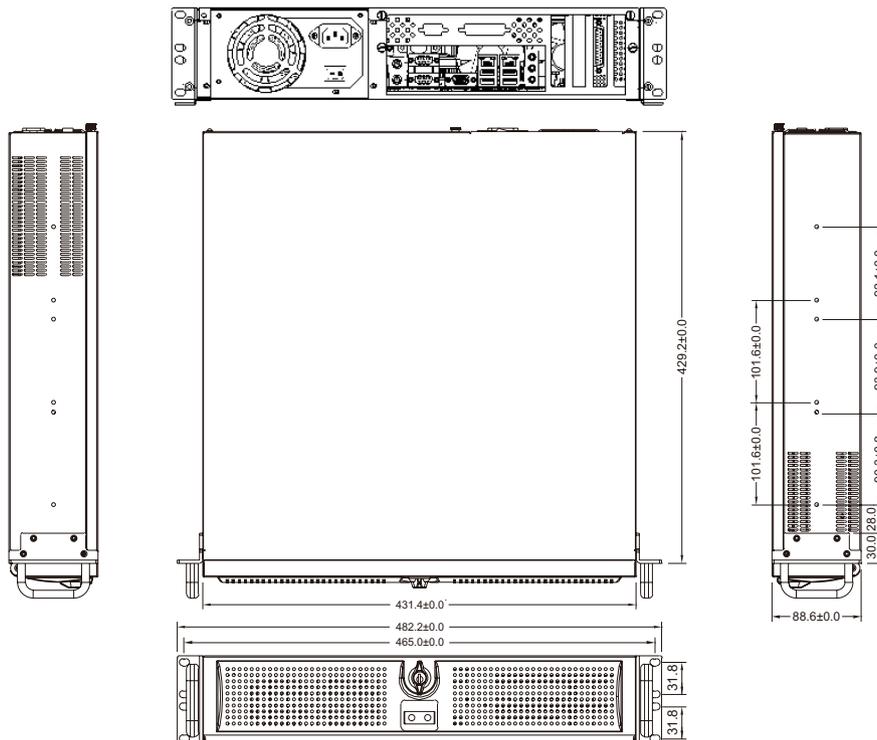


**Front Replaceable Air Filters/Fans**  
Convenient to change air filters or fans when needed



Rear View

## MECHANICAL DRAWING



Unit: mm

# AREMO-6163

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



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

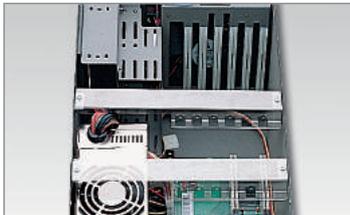
Maximum output	350W active PFC
Output Voltage & Current	+5V@12A; +12V1@18A; +12V2@18A; +3.3V@18A; -12V@0.3A, +5Vsb@2.5A
Input Voltage	90V ~ 264V AC, full range
Input Frequency	50 ~ 60Hz
Input Current	8A@115V, 8A@230V
Efficiency	> 80%
MTBF	100,000 hrs
EMI & Safety Approval	UL, TUV, CE, FCC, CB, VCCI, 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
<ul style="list-style-type: none"> <li>5.25" drive space for CD-ROM or mobile rack</li> </ul>	<ul style="list-style-type: none"> <li>Easy to install software</li> </ul>
<ul style="list-style-type: none"> <li>Two USB ports at the front</li> </ul>	<ul style="list-style-type: none"> <li>Easy to operate the system</li> </ul>
<ul style="list-style-type: none"> <li>One replaceable air filter</li> </ul>	<ul style="list-style-type: none"> <li>Easy cleaning</li> </ul>
<ul style="list-style-type: none"> <li>Can be vertically or horizontally mounted</li> </ul>	<ul style="list-style-type: none"> <li>Easy to fit into different space limited environments</li> </ul>
<ul style="list-style-type: none"> <li>Two adjustable positions for hold-down card retainer</li> </ul>	<ul style="list-style-type: none"> <li>For fixing all the cards more flexibly and tightly</li> </ul>
<ul style="list-style-type: none"> <li>Both 6-slot and PICMG backplane applicable</li> </ul>	<ul style="list-style-type: none"> <li>Easy to change to different backplane and keep in stock</li> </ul>
<ul style="list-style-type: none"> <li>Field replaceable power supply bracket for both normal PS/2 power supply and PS/2 type redundant power supply</li> </ul>	<ul style="list-style-type: none"> <li>Easy maintenance</li> </ul>

## REFINEMENT



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

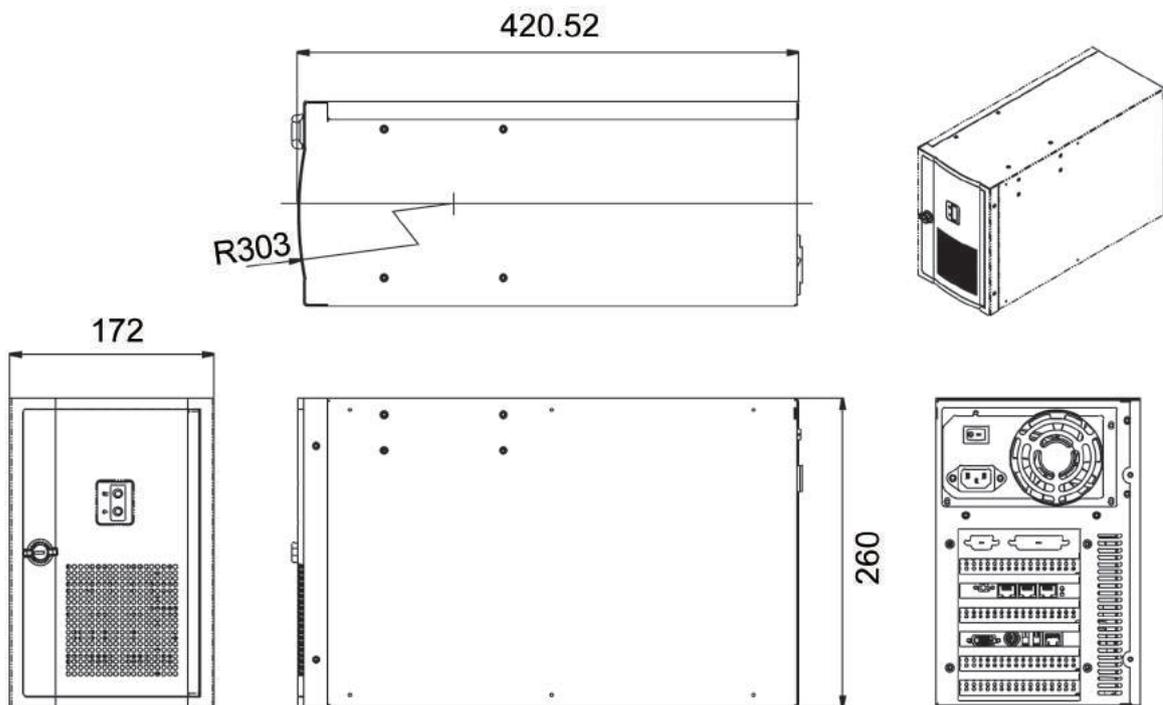


**Plastic Fan Filter**  
For easy cleaning and replace



**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 8Ω 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
<ul style="list-style-type: none"> <li>5.25" drive bays for CD-ROM or mobile rack</li> </ul>	<ul style="list-style-type: none"> <li>Easy to install software and mirror disk (RAID 1)</li> </ul>
<ul style="list-style-type: none"> <li>Two USB ports on the front panel</li> </ul>	<ul style="list-style-type: none"> <li>Easy to operate the system</li> </ul>
<ul style="list-style-type: none"> <li>One replaceable air filter</li> </ul>	<ul style="list-style-type: none"> <li>Easy cleaning</li> </ul>
<ul style="list-style-type: none"> <li>Can be vertically or horizontally mounted</li> </ul>	<ul style="list-style-type: none"> <li>Easy to fit into different space limited environments</li> </ul>
<ul style="list-style-type: none"> <li>Two adjustable positions for hold-down card retainer</li> </ul>	<ul style="list-style-type: none"> <li>For fixing all the cards more flexibly and tightly</li> </ul>
<ul style="list-style-type: none"> <li>Both 8-slot ISA and PICMG backplane applicable</li> </ul>	<ul style="list-style-type: none"> <li>Easy to change to different backplane and keep in stock</li> </ul>
<ul style="list-style-type: none"> <li>Field replaceable power supply bracket for both normal PS/2 power supply and PS/2 type redundant power supply</li> </ul>	<ul style="list-style-type: none"> <li>Easy maintenance</li> </ul>

## REFINEMENT



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

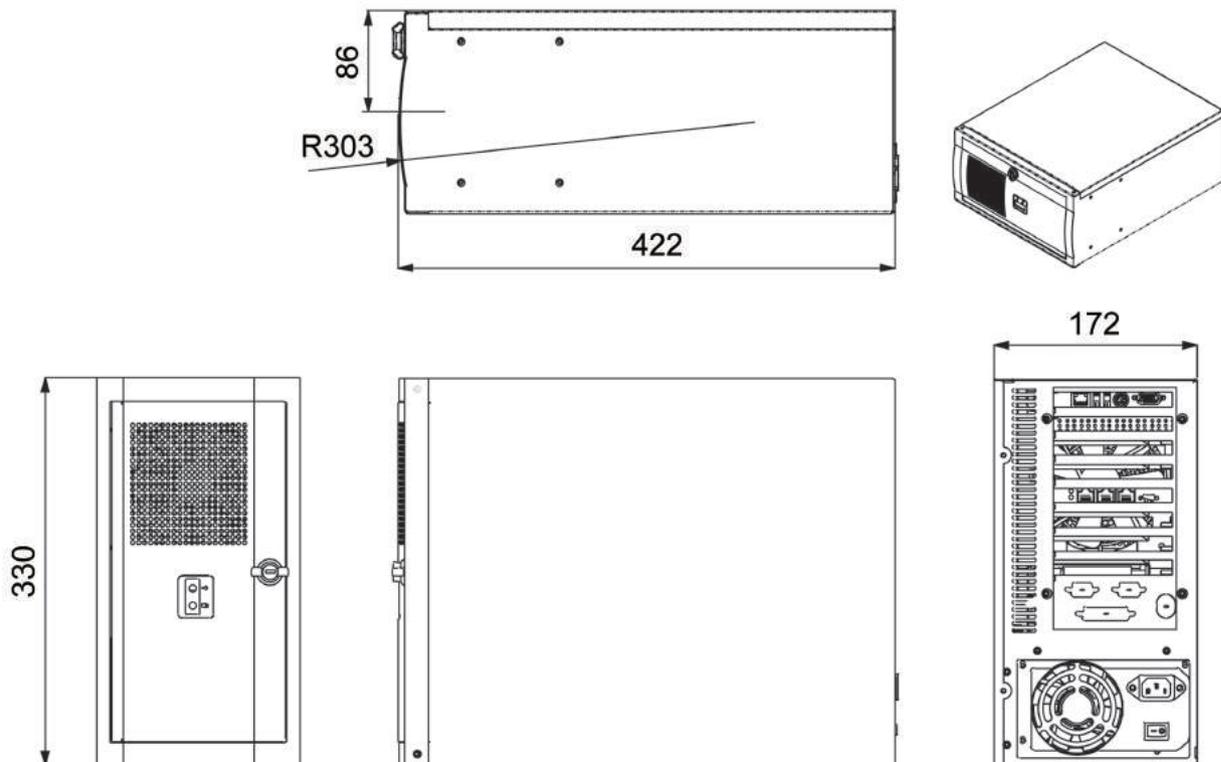


**Plastic Fan Filter**  
For easy cleaning and replacing



**Excellent Cooling System**  
New slot cover for better ventilation

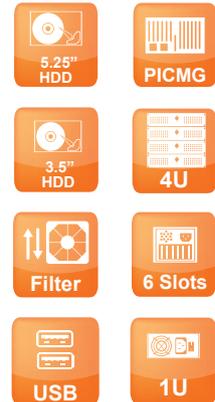
## MECHANICAL DRAWING



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
<ul style="list-style-type: none"> <li>One 5.25" drive bay for EZDRV</li> </ul>	<ul style="list-style-type: none"> <li>For both CD-ROM and FDD support or Hot-swappable HDD</li> </ul>
<ul style="list-style-type: none"> <li>One replaceable air filter</li> </ul>	<ul style="list-style-type: none"> <li>For easy cleaning</li> </ul>
<ul style="list-style-type: none"> <li>Can be vertically or horizontally mounted</li> </ul>	<ul style="list-style-type: none"> <li>Easy to fit into different space limited environment</li> </ul>
<ul style="list-style-type: none"> <li>Two adjustable positions for hold-down card retainer</li> </ul>	<ul style="list-style-type: none"> <li>For fixing all the cards more flexibly and tightly</li> </ul>
<ul style="list-style-type: none"> <li>Both 6-slot ISA and PICMG backplane applicable</li> </ul>	<ul style="list-style-type: none"> <li>Easy to change to different backplane and keep stock</li> </ul>
<ul style="list-style-type: none"> <li>Field replaceable power supply bracket for both normal PS/2 power supply and PS/2 type redundant power supply</li> </ul>	<ul style="list-style-type: none"> <li>For ease of maintenance</li> </ul>
<ul style="list-style-type: none"> <li>Removable fan kit</li> </ul>	<ul style="list-style-type: none"> <li>Easy to replace the broken fan</li> </ul>

## REFINEMENT



### Plastic Fan Filter

For easy cleaning and replacing



### Can be Mounted in Different Styles

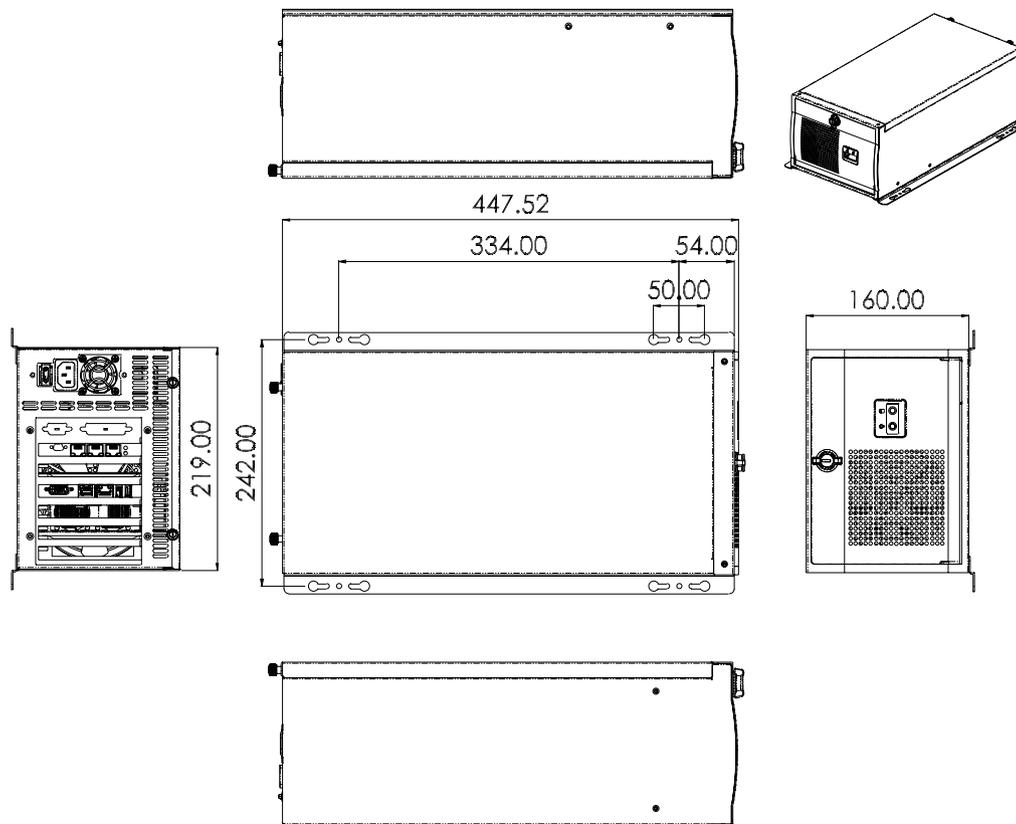
AREMO-6182 can be either vertically or horizontally installed



### 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

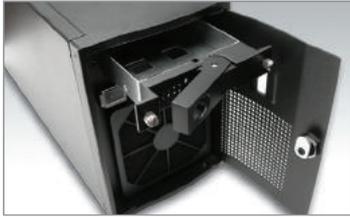
Maximum output	350W active PFC
Output Voltage & Current	+5V@18A; +12V1@16A; +12V2@16A; +3.3V@16A; -12V@0.3A, -5V@0.3A, +5Vsb@2.5A
Input Voltage	90V ~ 264V AC, full range
Input Frequency	47 ~ 63Hz
Input Current	6A@115V, 3A@230V
Efficiency	> 80%
MTBF	100,000 hrs
EMI & Safety Approval	UL, TUV, CE, FCC, 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
<ul style="list-style-type: none"> <li>One 5.25" drive bay for EZDRV</li> </ul>	<ul style="list-style-type: none"> <li>For both CD-ROM and FDD support or Hot-swappable HDD</li> </ul>
<ul style="list-style-type: none"> <li>Front replaceable air filter</li> </ul>	<ul style="list-style-type: none"> <li>Easy cleaning &amp; replacing</li> </ul>
<ul style="list-style-type: none"> <li>Two adjustable positions for hold-down card retainer</li> </ul>	<ul style="list-style-type: none"> <li>For fixing all the cards more flexibly and tightly</li> </ul>
<ul style="list-style-type: none"> <li>Both 6-slot ISA and PICMG backplane applicable</li> </ul>	<ul style="list-style-type: none"> <li>Easy to change to different backplane and keep in stock</li> </ul>
<ul style="list-style-type: none"> <li>1U 350W ATX power supply</li> </ul>	<ul style="list-style-type: none"> <li>Save the space inside the chassis</li> </ul>
<ul style="list-style-type: none"> <li>Special kit to combine dual systems into 4U space</li> </ul>	<ul style="list-style-type: none"> <li>Can be integrated as a fault tolerant system</li> </ul>

## REFINEMENT



### Special Configuration with EZDRV

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



### Easy to Mount

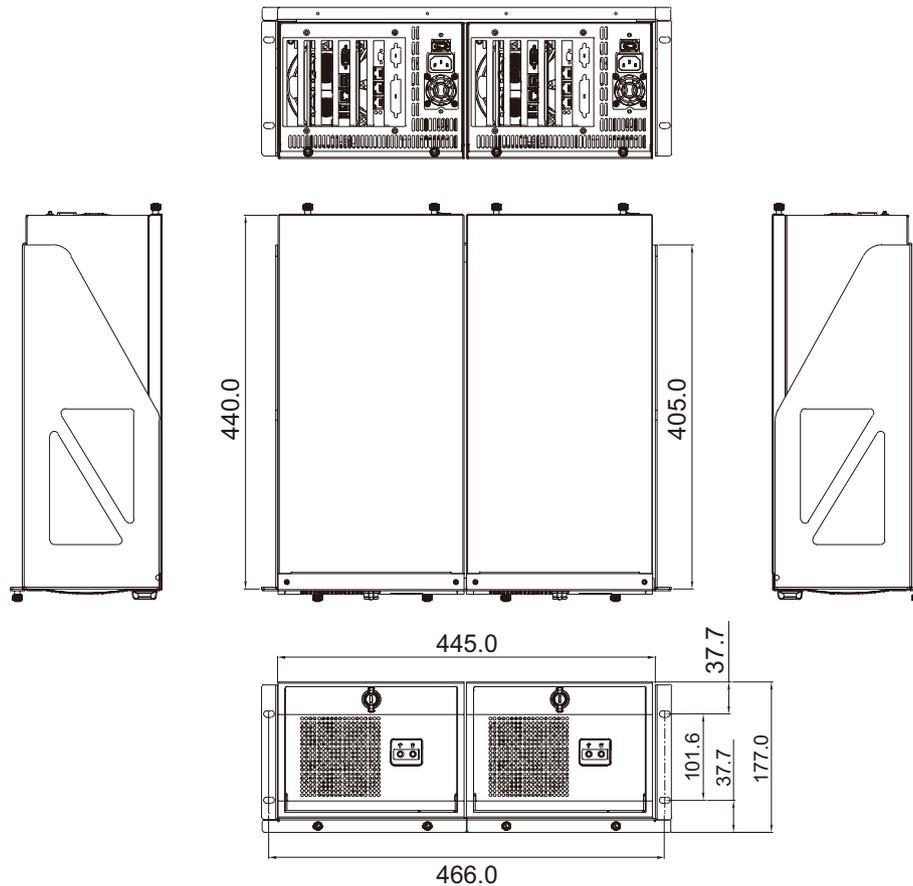
AREMO-6182 can be easily mounted on the supporter



### Two become One

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

## MECHANICAL DRAWING



Unit: mm

# 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.

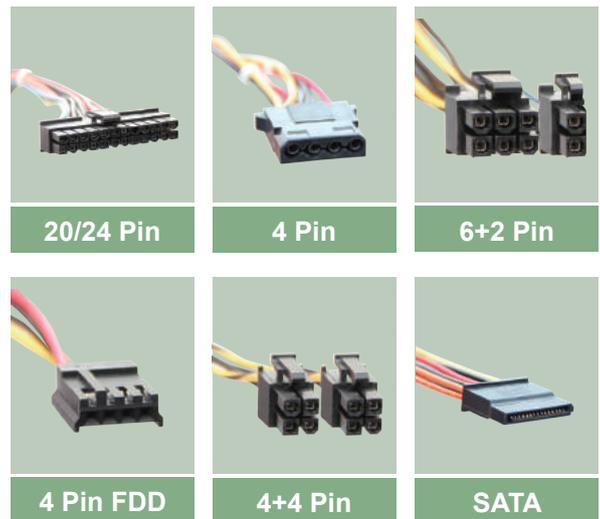


# About Power Supply

## ■ 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**



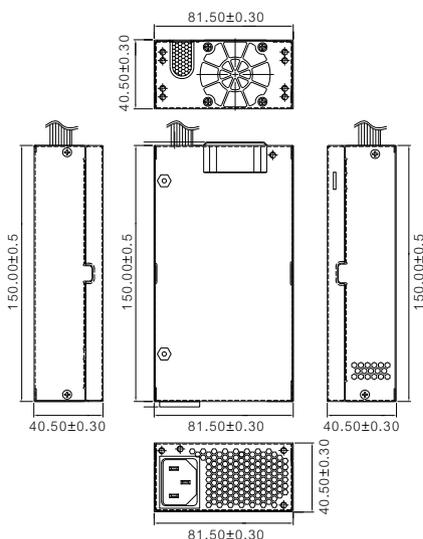
20 Pin    4Pin P4\_12V    4 Pin    4Pin FDD    SATA

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~4.8VV
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.



# PLUTO-A2501PJ

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

**250W  
Flex ATX**



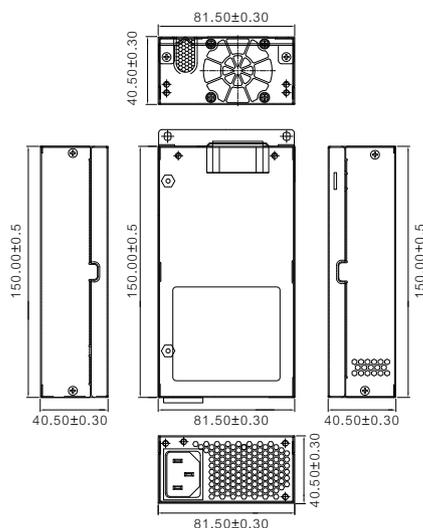
In an attempt to provide stable output and high reliability for different applications (communications, networks, servers and work stations), Portwell conducted a research to provide suitable PSU. In PLUTO series, only high quality components to meet those requirements are chosen.

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, PLUTO-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; 5.9" x 3.2" x 1.6"
Storage altitude	-75.03~15250 meter
Operation altitude	-75.03~3000 meter
Risetime	0.1 ms to 20 ms.



# PLUTO-D3501PJ

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

**350W  
PS/2 ATX**



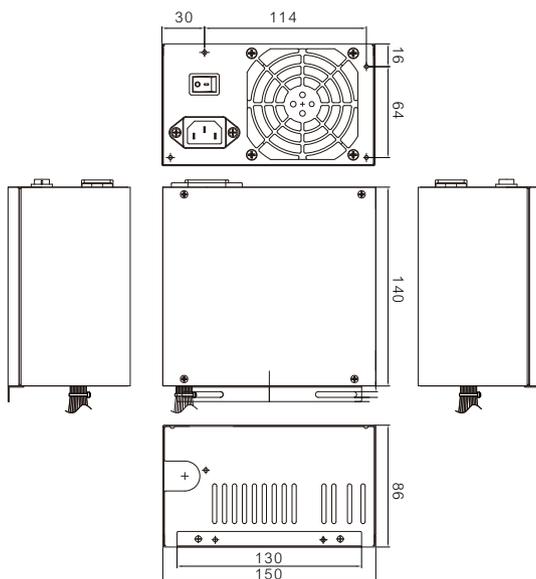
20 Pin    4Pin P4\_12V    6+2 Pin    4 Pin    4Pin FDD    SATA

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**

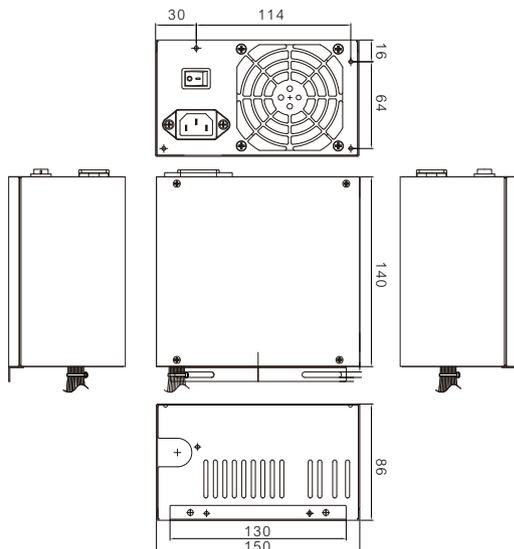


20 Pin    6+2 Pin    4+4 Pin    4 Pin    4Pin FDD    SATA

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"
Risetime	10 ms.

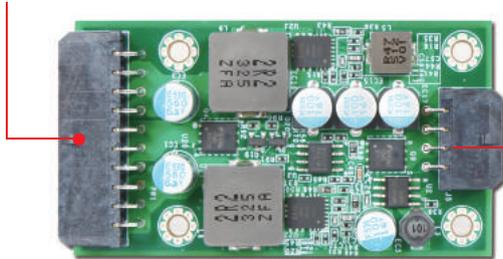


# GADIWA-B1120

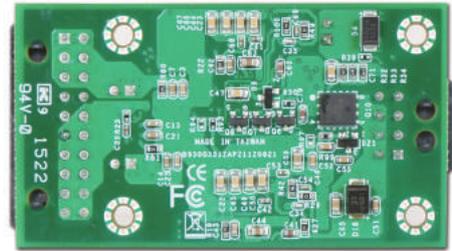
120W DC/DC 12V Input/ATX output,  
Board Type Converter



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

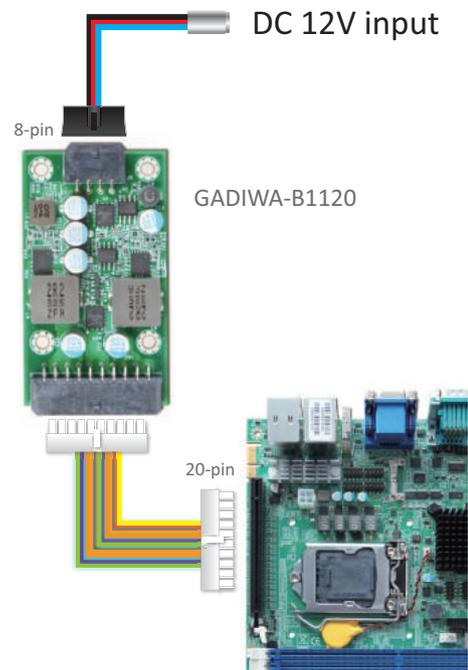
## CHARACTERISTICS

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

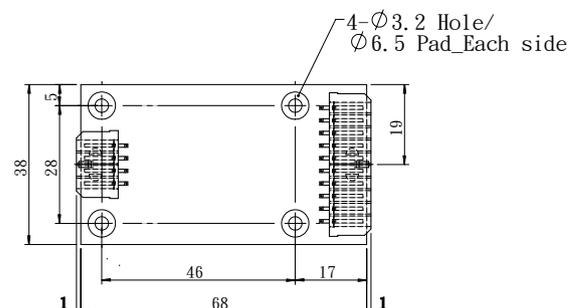
## ORDERING GUIDE

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

## INSTALLING DEMOSTRATION

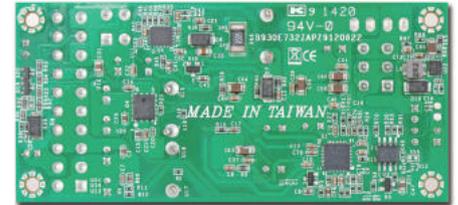
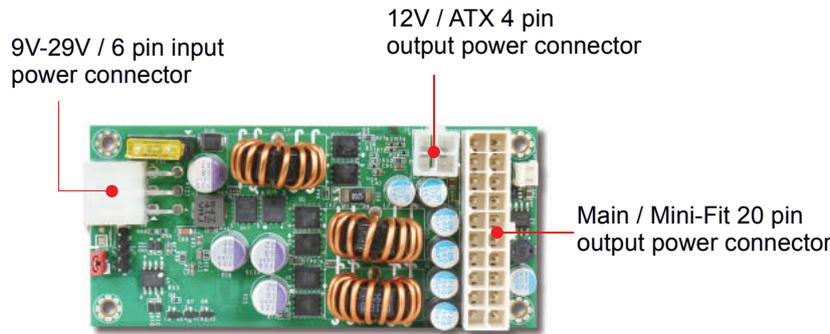


## MECHANICAL DRAWING



# GADIWA-B9120

120W DC/DC 9V~29V Input/ATX output,  
Board Type Converter



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	

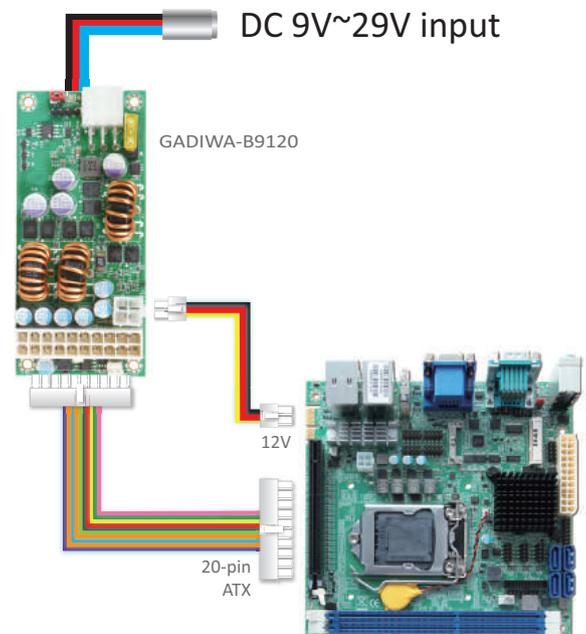
## CHARACTERISTICS

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

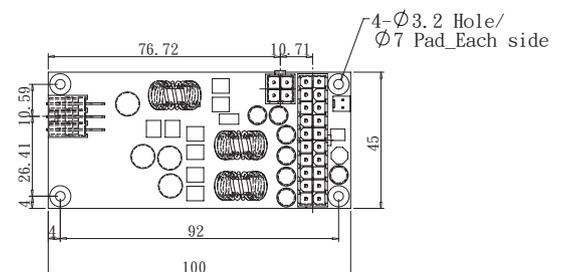
## ORDERING GUIDE

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

## INSTALLING DEMONSTRATION



## MECHANICAL DRAWING



# GADIWA-R9271

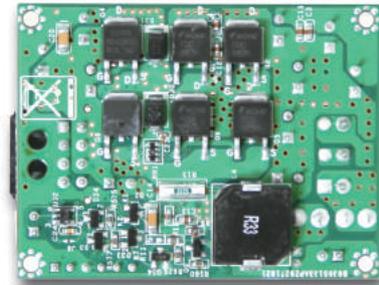
9V~27V/wide-input, 12V/output  
Regulator, Board Type



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

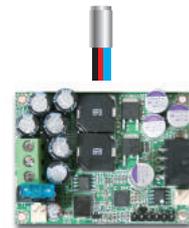
Output Voltage	Load Regulation	Cross Regulation
+12V	12.3V @ 0~8.5A	12.3V @ 0~8.5A

## ORDERING GUIDE

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

## INSTALLING DEMOSTRATION

DC 9V-27V  
input



GADIWA-R9271



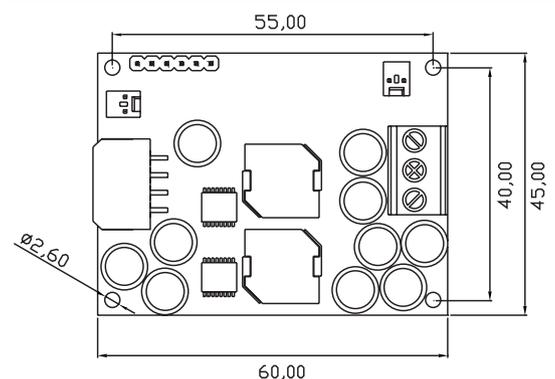
20-pin



GADIWA-P0901

8-pin

## MECHANICAL DRAWING



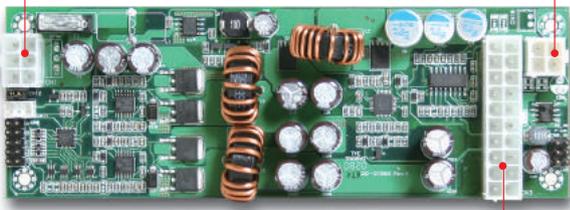
# GADIWA-3160

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

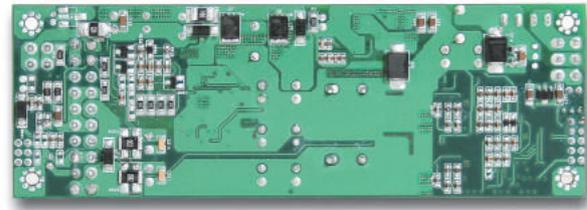


12~36V 6pin  
Input Power Connector

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	

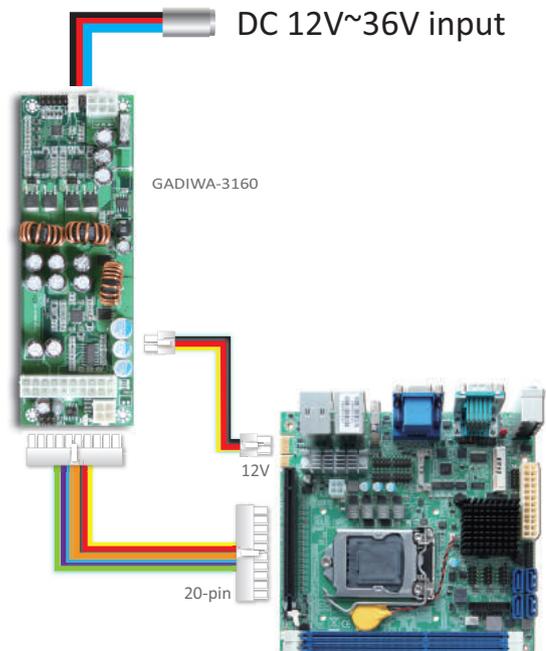
## CHARACTERISTICS

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

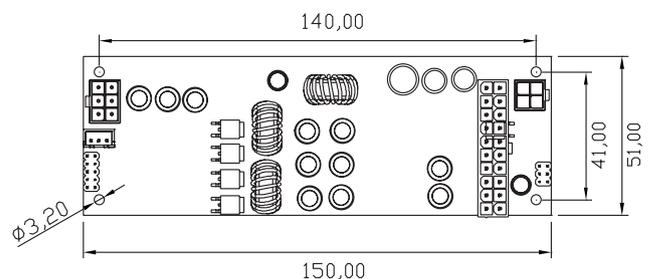
## ORDERING GUIDE

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

## INSTALLING DEMONSTRATION



## MECHANICAL DRAWING



# GADIWA-3161

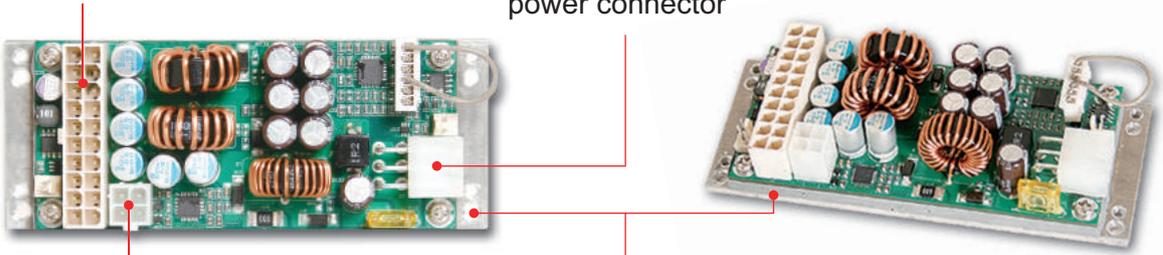
128W DC/DC 9V~29V/wide-input, ATX/output, Board Type Converter

Main / ATX 20 pin output power connector

9V~29V / 6 pin input power connector

12V / ATX 4 pin output power connector

Thermal Pad



GADIWA-3161 is a wide input board type converter. It normally support 128Watts and peak 160Watts. GADIWA-3161 can save more space and cost, it's not only capability for fan-less system but also suitability for different application. Besides, the converter is made and tested by automatic production line; therefore, it can provide high quality and performance.

## FEATURES

- 9~29V/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
- Socket Type Fuse Protection

## SPECIFICATION

Input Voltage	9V~29V, 6~9V workable with derating
Line Regulation	9V~29V/input
Output	128Watts / 160 Watts Peak
Efficiency	>85% @ 12V input @ 120W output
EMI & Safety Approval	CE, FCC
Input Connector	9V~29V / 3 pin
Output Connector	Main / ATX 20 pin
Dimension (WxDxH)	100 x 45 x 22.5 mm

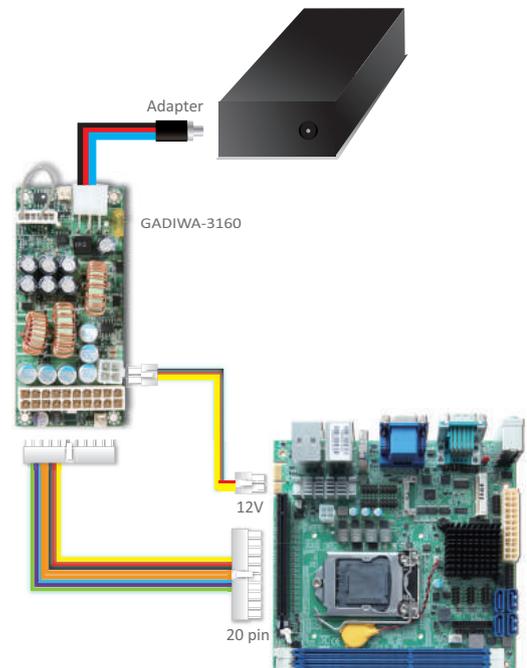
## CHARACTERISTICS

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

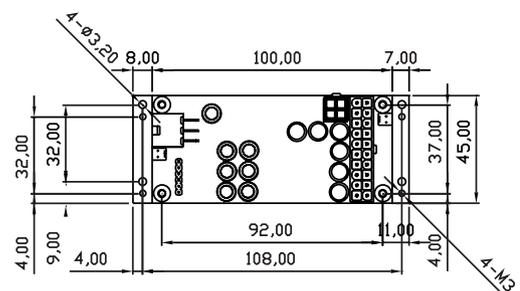
## ORDERING GUIDE

- GADIWA-3161  
128W DC/DC 9V~29V/wide-input, ATX/output, Board Type Converter

## INSTALLING DEMONSTRATION



## MECHANICAL DRAWING



# ORION-A1501



## 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
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



## 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"

**250W 1U ATX power supply with active PFC**

## 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

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

# 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
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-3052

### 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	>86%, 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-3051

### 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	>88%, 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-3050

### 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	>88%, 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



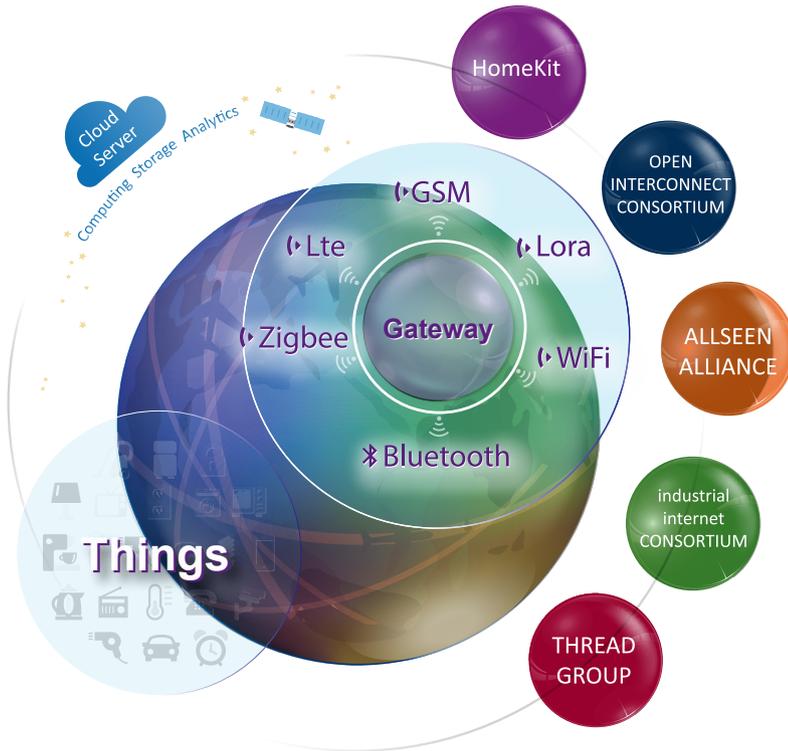
#### FEATURES

- 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	>88%, 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

# IoT Introduction



Most pundits in the industry predicted that there will be more than 200 billion devices by 2020, connected to the Internet, or some would call the "cloud". This is described as the era of Internet of Things (IoT).

The IoT is a big collection of smart sensors, networks, servers, and services that interact among them. This trend applies to all sectors or markets, and it is a way to automate, control, and manage factory, home, transportation, energy, medical/healthcare facility, etc.

All layers of networks, from applications, middleware, virtualization, connectivity, and devices, will contribute to realize the full power of IoT. For edge connectivity, the intelligent gateways play a major role in between the devices and the cloud in building the path for, collecting data from the devices for analysis, and forwarding the instructions from the upend servers to activate the devices.

## Our Solutions for the Internet of Things (IoT)

To leverage the current internet infrastructure, an intelligent IoT gateway is developed for the purpose of connecting legacy and new equipment, from garage door opener, vending machine, cooling or heating devices to industrial robot and wind turbine, to get the data from them, and in return to control them intelligently based on the instructions or analytical results from the connected servers. Since most of the industrial automation devices are often designed in different protocols of interconnectivity. A versatile IoT gateway with various protocol supports is also used as the path between these automation devices and the cloud.

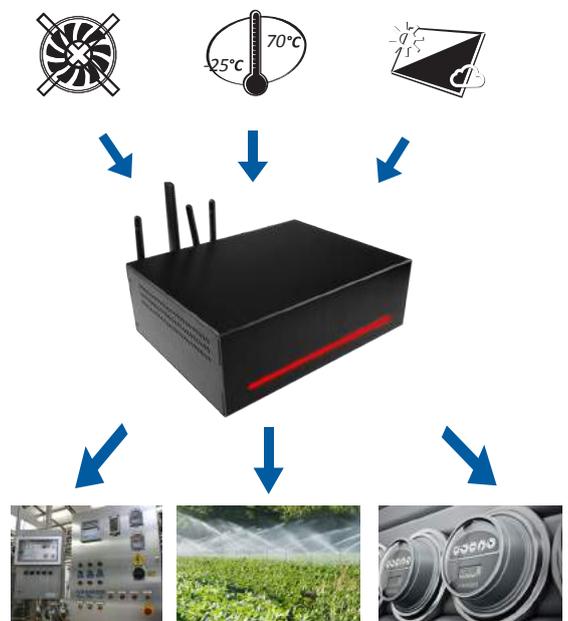
### IoT Gateway Solutions

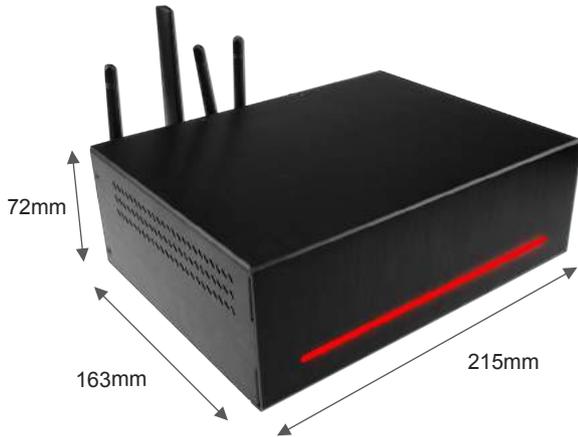
Portwell provides a series of the off-the-shelf Intelligent IoT Gateway solutions. Furthermore, to address customers' needs in supporting various protocols to different sensors, actuators, and devices, Portwell offers design service, including but not limited to, adding I/Os for more connectivity, customizing the chassis, fine-tuning the power source.

### IoT Software/Application Solutions

Based on yearly experiences working on software development, our team is capable of developing any software running on embedded systems or in any operating system. And can assist to build cloud services or develop APP for any IoT application. Even like the latest biometric technology, we also are capable of designing related solutions.

At Portwell, we unite all of our resources to provide appropriate total solutions. Under these products and services, we can assist to fulfill any IoT demand and design the most appropriate products and services in the fastest and most creative way.





World-first with patent of fan-less design and cross-platform gateway solutions for the Internet of Things (IoT). It provides with flexible choice of every wire or wireless communication interface. Its structure creates more selectivity, expandability, connectivity and convenience to the IoT application, which can help develop IoT system rapidly.

### FEATURES

- Intel® Valleyview-I SoC based platform
- Multi-wireless or wire module swappable design for connections such as 4 port Ethernet, 1 port Ethernet, RS-232, RS-422, RS-485, 2G, 3G, Wi-Fi and 1 port USB 3.0 (Optional)
- One Pan Network socket supporting connections such as ZigBee, LoRa or BLE connectivity (Optional)
- Fan-less design

### ORDERING GUIDE

- **XM-1-6060-E3845**  
Intel® ATOM™ E3845 1.91GHz Quad Core
- **XM-1-6060-E3815**  
Intel® ATOM™ E3815 1.46GHz Single Core
- **XM-1-6060-E3827**  
Intel® ATOM™ E3827 1.75GHz Dual Core
- **XM-1-6050-5010U**  
Intel® Core™ i3-5010U 2.1GHz Dual Core
- **XM-1-6050-5350U**  
Intel® Core™ i5-5350U 1.8GHz Dual Core
- **XM-1-6061-N3710**  
Intel® Pentium® Quad Core 1.6GHz
- **XM-1-6061-N3160**  
Intel® Celeron® Quad Core 1.6GHz
- **XM-1-6061-N3060**  
Intel® Celeron® Dual Core 1.6GHz

### GENERAL

CPU	- Intel® Atom™ E3800 family processor - Intel® 5th Gen Core™ i5 and i3 processor - Intel® Pentium®/Celeron® Dual/Quad Core N3000 series
Memory	Support up to 8GB DDR3L 1066/1333
Storage Devices	1x Micro SD card socket (up to 32 GB)
BIOS	AMI BIOS
OS Support	Linux or Windows

### EXTERNAL I/O

Ethernet	1x 10/100/1000 Ethernet
Others	- 1x DC Power JACK - 1x Reset/Power button - 2x LED

### EXPANSION

USB	5x USB 3.0
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### Optional Connectivity

Supported Connectivity	Wi-Fi/ ZigBee/ Bluetooth/ BLE/ LoRa/ 2G/ 3G
Antenna	1x or 2x Antenna hole (only Wi-Fi)

### Power Supply Unit

Power Input	DC 12V
Adaptor	AC 100-240V

### Mechanical & Environment

Dimension	215 x 163 x 72mm
Weight	2260g
Operation Temperature	0°C ~ 60°C
Storage Temperature	-40°C ~ 85°C
Storage Humidity	10%~95% @40°C, non-condensing
Mounting	Desk, Vesa / DIN mounting



# Wire/Wireless modules model list

## 2G



Chip	AcSip AE2502b
GSM Bands	850/900/1800/1900 MHz
Certification	CE / FCC pre-scan pass

## 1 port Ethernet



Ethernet Chip	ASIX AS88179
PHY	10/100/1000

## 4 port Ethernet



Ethernet Chip	ASIX AS88179
Switch IC	Broadcom BCM53115
PHY	10/100/1000

## 3G



Chip	Quectel UC20-G
Frequency Bands	GPS: 1575.42MHz GLONASS: 597.5 ~ 1605.8MHz UMTS: 800/850/900/1900/2100MHz GSM: 850/900/1800/1900MHz
Certification	CE / FCC / IC / GCF / PTCRB / Vodafone / RCM / Anatel / NBTC / AT&T / JATE / TELEC / KC / NCC / OFCA / SKT / Rogers / TA / NAL

## Wi-Fi



Chip	Sparklan WUBR-508N(MU)
Standard	802.11 a/b/g/n 2T2R
Frequency	2.4GHz / 5GHz
Certification	FCC / CE / IC / Telec

## LoRa



Product Name	Portwell XL-10
Frequency Range	902-928 MHz
Bandwidth	62.5 - 500KHz
Effective Bitrate	146 - 37500 bps

## RS-232 / RS-422 / RS-485



Chip	FTDI FT232R
Baud Rate	300-1M Baud
Data Bit	4, 5, 6, 7, 8
Stop Bit	1, 1.5, 2
Flow Control	Xon / Xoff, RTS/ CTS, NONE

## ZigBee



Product Name	XBee (PRO) S2C ZigBee
Transceiver Chipset	Silicon Labs EM357 SoC
Data Rate	RF 250 Kbps, Serial up to 1 Mbps
Indoor/urban Range	200 ft (60 m)
Certification	FCC / IC

## BLE



Product Name	TinySine Bluetooth Bee
Chip	TI CC2541
BT Version	Bluetooth Specification V4.0 & BLE
Working Frequency	2.4 ~ 2.48GHz unlicensed ISM band
Modulation	GFSK (Gaussian Frequency Shift Keying)
Transmission Distance	50 ~ 60m in free space



With modularized design on its wireless connectivity and sensor module, DS-1/DS-1B is equipped with multiple functions which makes the sensor node more flexible. In order to challenge the lowest computing, DS-1/DS-1B is Portwell's own-designed Arduino motherboard using a Pan Network socket which can apply to different wireless module, ZigBee Wi-Fi, BLE or LoRa, and different types of sensor modules, ranging from analog to digital, 3V to 5V voltage. The node can support AC, solar panel or lithium battery for power supply.

## FEATURES

- ATmega32U4 running at 8MHz
- Arduino-Compatible Bootloader
- Applying to various sensor modules, analog, digital, 3V or 5V voltage
- One Pan Network socket supporting connections such as Zigbee, LoRa or BLE connectivity (Optional)
- Charging Lithium Polymer battery through solar power or USB
- Fan-less design

## ORDERING GUIDE

- **DS-1**  
ATmega32U4
- **DS-1B**  
ATmega32U4 w/ battery and solar panel

## Optional Accessories

Wi-Fi/ ZigBee/ Bluetooth/ BLE/ LoRa wireless modules w/ cable and antenna

AC-DC adaptor

## GENERAL

Processor	Atmel ATmega32U4 8MHz
Storage Devices	1x 3.3V SPI Flash(Optional)

## EXTERNAL I/O

USB	1x Micro USB 2.0
Button	1x GPIO Button
Solar panel connector	1x JST 2.0 (only apply to DS-1B)

## EXPANSION

Jumper	4x Jumper
Pan Network	1x Pan Network socket
Others (internal header)	<ul style="list-style-type: none"> <li>- 1x I2C port</li> <li>- 1x GPIO port</li> <li>- 1x Digital port</li> <li>- 1x Analog port</li> <li>- 1x SPI port</li> <li>- 1x Battery connector (only apply to DS-1B)</li> <li>- 1x Reset/Power button</li> </ul>

## Optional Connectivity

Supported Connectivity	Wi-Fi/ ZigBee/ Bluetooth/ BLE/ LoRa
Antenna	1x Antenna

## Power Supply Unit

Power Input	DC 5V
Adaptor	AC 100-240V

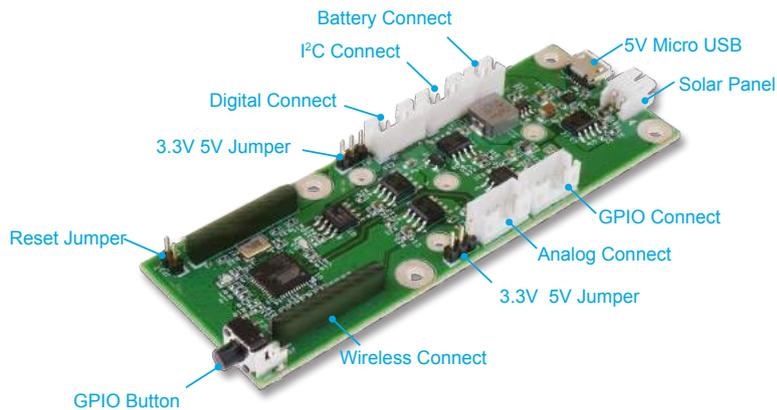
## Mechanical & Environment

Dimension	DS-1 : 94.5 x 40 x 32.55mm DS-1B : 94.5 x 80.2 x 32.55mm
Weight	DS-1 : 150g DS-1B : 380g
Operation Temperature	0°C ~ 60°C
Storage Temperature	-40°C ~ 85°C
Storage Humidity	10%~95% @40°C, non-condensing
Mounting	Desk

## REAR IO



DS-1/DS-1B can connect to different sensors, like Temperature, Humidity, UV, Liteness, Soil Moisture, Water, Vibration, Infrared sensors already. And also, DS-1/DS-1B can detect Oxygen, CO2, CO(Carbon Monoxide), Alcohol, LPG, HCHO, Smoke, Combustible Gas. With modularized wireless transmission devices, which is connected through serial BUS interface internally, the facility possesses all kinds of possibility of wireless communication. DS-1 is powered by Micro USB and DS-1B is equipped with two high capacity lithium batteries, which can power on by solar panels or micro USB, making this facility more convenient in applications.



## Applications



Smart City



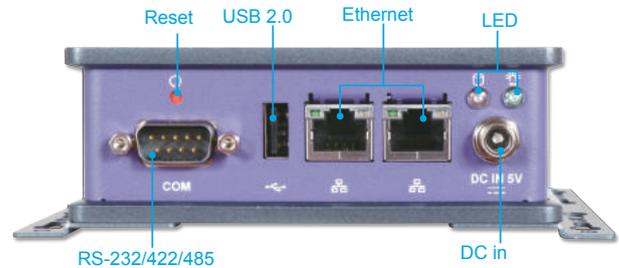
Plant Management



Pipeline Management



Disaster Prevention System



The Portwell PI-QK10 adopts the single-core 32nm Intel® Quark™ SoC X1000, with a clock rate of up to 400 MHz. The PI-QK10 IoT gateway is designed with several highly-integrated features, including dual 10/100 Fast Ethernet, USB 2.0 port, and few optional WiFi or Wireless modules. The PI-QK10 includes embedded Linux operating system.

## FEATURES

- Intel® Quark™ SoC X1000 single core 400MHz
- DC 5-12V power input
- One Full-Size Mini-PCle socket supporting connections such as 3G or LTE connectivity (Optional)
- One Half-Size Mini-PCle socket supporting connections such as WiFi or Bluetooth connectivity (Optional)
- One Pan Network socket supporting connections such as ZigBee, LoRa or BLE connectivity (Optional)
- Fan-less design

## ORDERING GUIDE

- **PI-QK10\_1011**  
Intel® Quark™ SoC X1011
- **PI-QK10\_1021**  
Intel® Quark™ SoC X1021

## Optional Accessories

Wi-Fi/ ZigBee/ Bluetooth/ BLE/ LoRa/ 3G/ LTE wireless modules w/ cable and antenna

AC-DC adapter

Factory installed 4/ 8/ 16 GB MLC type industrial grade Micro SD card

## GENERAL

Form Factor	Intel® Quark™ X1011/X1021
Memory	DDR3 1GB
Storage Devices	1x Micro SD card socket (up to 16 GB)
OS Support	Embedded Linux

## EXTERNAL I/O

Ethernet	2x 10/100 Ethernet
USB	1x USB 2.0
Serial Port	1x COM (RS-232/RS-422/RS-485)

## EXPANSION

Mini-PCle	- 1x Full-size Mini-PCle socket - 1x Half-size Mini-PCle socket
Pan Network	1x Pan Network socket
Others (internal header)	- 1x I2C - 1x GPIO - 1x ADC - 1x reset/power button - 1x USB 2.0

## Optional Connectivity

Supported Connectivity	Wi-Fi/ ZigBee/ Bluetooth/ BLE/ LoRa/ 3G/ LTE
Antenna	4x Antenna hole

## Power Supply Unit

Power Input	DC 5-12V
Adaptor	AC 100-240V

## Mechanical & Environment

Dimension	116 x 116 x 40 mm
Weight	600g
Operation Temperature	0°C ~ 60°C
Storage Temperature	-40°C ~ 85°C
Mounting	Desk, DIN / Wall / Panel mounting





# 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.



## 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.



## 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.

**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

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