Harmony Rack iPC

Optimized, Universal and Performance

User Manual

10/2021

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www.schneider-electric.com

Schneider Electric

The information provided in this documentation contains general descriptions and/or technical characteristics of the performance of the products contained herein. This documentation is not intended as a substitute for and is not to be used for determining suitability or reliability of these products for specific user applications. It is the duty of any such user or integrator to perform the appropriate and complete risk analysis, evaluation and testing of the products with respect to the relevant specific application or use thereof. Neither Schneider Electric nor any of its affiliates or subsidiaries shall be responsible or liable for misuse of the information contained herein. If you have any suggestions for improvements or amendments or have found errors in this publication, please notify us.

All pertinent state, regional, and local safety regulations must be observed when installing and using this product. For reasons of safety and to help ensure compliance with documented system data, only the manufacturer should perform repairs to components.

When devices are used for applications with technical safety requirements, the relevant instructions must be followed.

Failure to use Schneider Electric software or approved software with our hardware products may result in injury, harm, or improper operating results.

Failure to observe this information can result in injury or equipment damage.

Table of Contents

Safety Information

Important Information

NOTICE

Read these instructions carefully, and look at the equipment to become familiar with the device before trying to install, operate, service, or maintain it. The following special messages may appear throughout this documentation or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.

The addition of this symbol to a “Danger” or “Warning” safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠ DANGER

DANGER indicates a hazardous situation which, if not avoided, **will result in** death or serious injury.

⚠ WARNING

WARNING indicates a hazardous situation which, if not avoided, **could result in** death or serious injury.

⚠ CAUTION

CAUTION indicates a hazardous situation which, if not avoided, **could result** in minor or moderate injury.

NOTICE

NOTICE is used to address practices not related to physical injury.

PLEASE NOTE

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction and operation of electrical equipment and its installation, and has received safety training to recognize and avoid the hazards involved.

About the Book

At a Glance

Document Scope

This manual describes the configuration and usage of the Performance, Universal and Optimized Rack iPCs, part of the range of Harmony industrial PCs.

The Rack iPC is designed to operate in an industrial environment.

Products:

- HMIRXOHCA3W01 - Rack PC 2U Optimized HDD AC 3 slots
  - 240 Vac
  - 2.5 GHz Celeron G540 processor
  - 2 GB RAM
  - 500 GB Hard disk drive (HDD)
  - WES 7 32 SP1
- HMIRXOHCA3001 - Rack PC 2U Optimized HDD AC 3 slots No OS
  - 240 Vac
  - 2.5 GHz Celeron G540 processor
  - 2 GB RAM
  - 500 GB Hard disk drive (HDD)
  - No Operating System
- HMIRSOHPA3W01 - Rack PC 2U Optimized HDD AC 3 slots
  - 240 Vac
  - 2.5 GHz Celeron G850 processor
  - 2 GB RAM
  - 500 GB 24/7 Hard disk drive (HDD)
  - WES 7 64 SP1
- HMIRSUH3A3701 - Rack PC 2U Universal HDD AC 3 slots
  - 240 Vac
  - 3.3 GHz Intel i3-2120 processor
  - 2 x 2 GB RAM
  - 500 GB 24/7 Hard disk drive (HDD)
  - Windows® 7 Ultimate (64 bit)

- HMIRSUS3A3701 - Rack PC 2U Universal SSD AC 3 slots
  - 240 Vac
  - 3.3 GHz Intel i3-2120 processor
  - 2 x 2 GB RAM
  - 80 GB Solid state drive (SSD)
  - Windows® 7 Ultimate (64 bit)
- HMIRSPHXA6701 - Rack PC 4U Performance HDD AC 6 slots
  - 240 Vac
  - 3.2 GHz Xeon E3-1225 processor
  - 2 x 2 GB RAM
  - 500 GB 24/7 Hard disk drive (HDD)
  - Windows® 7 Ultimate (64 bit)
- HMIRSPHXA67P1 - Rack PC 4U Perf. HDD AC 6 slots PES
  - 240 Vac
  - 3.2 GHz Xeon E3-1225 processor
  - 4 x 2 GB RAM
  - 500 GB 24/7 Hard disk drive (HDD)
  - Windows® 7 Ultimate (64 bit)
- HMIRSPFXA6701 - Rack PC 4U Performance SSD AC 6 slots
  - 240 Vac
  - 3.2 GHz Xeon E3-1225 processor
  - 2 x 2 GB RAM
  - 80 GB Solid state drive (SSD)
  - Windows® 7 Ultimate (64 bit)
- HMIRSPFXR6702 - Rack PC 4U Perf. SSD AC redund. 6 slots
  - 240 Vac
  - 3.2 GHz Xeon E3-1225 processor
  - 2 x 2 GB RAM
  - 80 GB Solid state drive (SSD)
  - Windows® 7 Ultimate (64 bit)
- HMIRSPSXR6S01 - Rack PC 4U Perf. HDD AC 6 slots server
  - 240 Vac
  - 3.2 GHz Xeon E3-1225 processor
  - 2 x 4 GB ECC RAM
  - 2 x 500 GB RAID 24/7
  - Win server 2008

NOTE: The part number for your unit may not be included in this user manual. Commercial part numbers listed in the user manual are for products available when this user manual was published. New part numbers may be added to the product range.

NOTE: Vijeo Designer Run Time is not installed on Rack iPC. The **Vijeo Designer Run Time** can be installed from **.exe** in VJD (**Vijeo Designer**) DVD.

NOTE: Operating system, Windows server 2008, is not supported by **Vijeo Designer**.

The part numbers are always composed of a prefix (HMI), a space, followed by a serial arrangement of 9 alphanumeric characters. Each one of the 9 characters matches with one characteristic of the Rack iPC, such as storage device size, storage device type, memory size, or bundled software.

The following table is a legend that identifies the features corresponding to each character of the part number:

Character number		**Prefix**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Part number example		**HMI**	**RS**	**P**	**H**	**C**	**A**	**3**	**7**	**0**	**1**
iPC family	Rack iPC		RS								
iPC type	Optimized			O							
	Universal			U							
	Performance			P							
Drive	Flash drive (SSD)				S						
	Hard disk (HDD)				H						
CPU type	Intel Celeron G540 (Optimized RXO)					C					
	Intel Celeron G850 (Optimized RSO)					P					
	Intel i3-2120 (Universal)					3					
	Intel Xeon E3-1225 (Performance)					X					
Power supply	AC						A				
	Redundant AC						R				
Expansion slots	3							3			
	6							6			
Operating system	WES 7 32 SP1								W		
	WES 7 64 SP1								W		
	Windows® 7 Ultimate (64 bit)								7		
	Win server 2008								S		
	None								0		
Bundled software	None									0	
Hardware iteration	Initial										1
	Second										2
	And so on.										And so on.

NOTE: All instructions applicable to the enclosed product and all safety precautions must be observed.

Validity Note

This documentation is valid for Harmony Rack iPC.

The technical characteristics of the devices described in the present document also appear online. To access the information online:

Step	Action
1	Go to the Schneider Electric home page *www.schneider-electric.com*.
2	In the **Search** box type the reference of a product or the name of a product range. ● Do not include blank spaces in the reference or product range. ● To get information on grouping similar modules, use asterisks (*).
3	If you entered a reference, go to the **Product Datasheets** search results and click on the reference that interests you. If you entered the name of a product range, go to the **Product Ranges** search results and click on the product range that interests you.
4	If more than one reference appears in the **Products** search results, click on the reference that interests you.
5	Depending on the size of your screen, you may need to scroll down to see the datasheet.
6	To save or print a datasheet as a .pdf file, click **Download XXX product datasheet**.

The characteristics that are presented in the present document should be the same as those characteristics that appear online. In line with our policy of constant improvement, we may revise content over time to improve clarity and accuracy. If you see a difference between the document and online information, use the online information as your reference.

Registered trademarks

PL7, **Vijeo Designer**, **Vijeo Citect, and Unity** are registered trademarks of Schneider-Electric.

Microsoft® and Windows® are registered trademarks of Microsoft corporation.

Intel®, Atom®, Celeron®, Xeon® and Core 2 Duo® are registered trademarks of Intel corporation.

IBM® is a registered trademark of international business machine corporation.

Related Documents

Title of Documentation	Reference Number
Vijeo Designer Tutorial	35007035

You can download these technical publications and other technical information from our website at https://www.se.com/ww/en/download/ .

Product Related Information

⚠ DANGER

POTENTIAL FOR EXPLOSION IN HAZARDOUS LOCATION

Do not use these products in hazardous locations.

Failure to follow these instructions will result in death or serious injury.

⚠⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

- Remove all power from the device before removing any covers or elements of the system, and prior to installing or removing any accessories, hardware, or cables.
- Unplug the power cable from both the Harmony Industrial PC and the power supply.
- Always use a properly rated voltage sensing device to confirm that power is off.
- Replace and secure all covers or elements of the system before applying power to the unit.
- Use only the specified voltage when operating the Harmony Industrial PC. The AC unit is designed to use 100...240 Vac input.

Failure to follow these instructions will result in death or serious injury.

⚠ WARNING

LOSS OF CONTROL

- The designer of any control scheme must consider the potential failure modes of control paths and, for certain critical control functions, provide a means to achieve a safe state during and after a path failure. Examples of critical control functions are emergency stop and overtravel stop.
- Separate or redundant control paths must be provided for critical control functions.
- System control paths may include communication links. Consideration must be given to the implications of unanticipated transmission delays or failures of the link.(1)
- Each implementation of a Harmony Industrial PC must be individually and thoroughly tested for proper operation before being placed into service.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

(1) For additional information, refer to *NEMA ICS 1.1 (latest edition)*, *"Safety Guidelines for the Application, Installation, and Maintenance of Solid State Control" and to NEMA ICS 7.1 (latest edition),"Safety Standards for Construction and Guide for Selection, Installation and Operation of Adjustable-Speed Drive Systems" or other applicable standards in your location.*

NOTE: No SRAM in Rack iPC: Data is on RAM.
Data can be saved from RAM every 10 s and automatically saved at **Vijeo Designer Run Time** exit:

- To a second drive, mandatory if main drive is card write protected (EWF enabled).
- To a second drive without operating system is recommended for all configurations (USB stick or second SSD/HDD).

⚠ WARNING
HIGH RISK TO LOSE DATA ON POWER LOSS
Vijeo Designer data is in RAM and not saved, therefore data will be lost in case of power failure.
Failure to follow these instructions can result in death, serious injury, or equipment damage.

NOTE: The Rack iPC is a highly configurable device and is not based on a real-time operating system. Changes to the software and settings of the following must be considered new implementations as discussed in the previous warning messages. Examples of such changes include:

- System BIOS
- System Monitor *(see page 141)*
- Operating system
- Installed hardware
- Installed software

⚠ WARNING
UNINTENDED EQUIPMENT OPERATION
Use only Schneider Electric software with the devices described in this manual.
Failure to follow these instructions can result in death, serious injury, or equipment damage.

Part I
General Overview

Subject of this Part

This part provides an overview of the Harmony Rack iPC products.

What Is in This Part?

This part contains the following chapters:

Chapter 1
Important Information

General

This chapter describes specific aspects related to the operation of the Rack iPC.

What Is in This Chapter?

This chapter contains the following topics:

FCC Radio Frequency Interference Statement for USA.

Federal Communications Commission (FCC) Radio Interference Information

This equipment has been tested and found to comply with the federal communications commission (FCC) limits for a Class A digital device, according to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a commercial, industrial, or business environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause or be subject to interference with radio communications. To minimize the possibility of electromagnetic interference in your application, observe the following two rules:

- Install and operate the Harmony Industrial PC in such a manner that it does not radiate sufficient electromagnetic energy to cause interference in nearby devices.
- Install and test the Harmony Industrial PC to ensure that the electromagnetic energy generated by nearby devices does not interfere with the Harmony Industrial PC's operation.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this product.

⚠ WARNING

ELECTROMAGNETIC / INTERFERENCE

Electromagnetic radiation may disrupt the Harmony Industrial PC's operations, leading to unintended equipment operation. If electromagnetic interference is detected:

- Increase the distance between the Harmony Industrial PC and the interfering equipment.
- Reorient the Harmony Industrial PC and the interfering equipment.
- Reroute power and communication lines to the Harmony Industrial PC and the interfering equipment.
- Connect the Harmony Industrial PC and the interfering equipment to different power supplies.
- Always use shielded cables when connecting the Harmony Industrial PC to a peripheral device or another computer.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Qualified Personnel

General

Only qualified personnel can install, operate, and maintain the product. A qualified person is one who has skills and knowledge related to the construction, operation, and installation of electrical equipment, and has received safety training to recognize and avoid the hazards involved. Refer to the most current release of NFPA 70E®, Standard for Electrical Safety in the Workplace, for electrical safety training requirements or other applicable standards in your location. Examples of qualified personnel may include:

- At the application design level, engineering department personnel who are familiar with automation safety concepts (for example, a design engineer).
- At the equipment implementation level, personnel who are familiar with the installation, connection, and commissioning of automation equipment (for example, an installation assembly or wiring engineer or a commissioning technician).
- At the operation level, personnel who are experienced in the use and control of automation and computing equipment (for example, an operator).
- For preventive or corrective maintenance, personnel trained and qualified in regulating or repairing automated and computing devices (for example, an operating technician or after-sales service technician).

Certifications and Standards

Agency Certifications

Schneider Electric submitted this product for independent testing and qualification by third-party agencies. These agencies have certified this product as meeting the following standards.

- Underwriters laboratories Inc., UL 60950-1, 2nd edition, and CSA C22.2 N°60950-1-07, information technology equipment.

Schneider Electric is in the process of certifying compliance with the following standards.

- EAC Eurasian conformity. Refer to product markings.
- CCC China compulsory product certification. Refer to product markings.

For detailed information, contact your local distributor and see the catalog and markings on the product.

Compliance Standards

Schneider Electric tested this product for compliance with the following compulsory standards.

United States:

- Federal communications commission, FCC Part 15

Europe: CE

- Directive 2006/95/EC (Low voltage)
- Directive 2004/108/EC (EMC)
- EMI: EN55011 (Group 1, Class A), EN 61000-6-4
- Information technology equipment: EN 60950-1
- EMS: EN 61000-6-2

Qualification Standards

Schneider Electric voluntarily tested this product to additional standards. The additional tests performed, and the standards under which the tests were conducted, are identified in environmental characteristics.

Hazardous Substances

This product is compliant with:

- WEEE, Directive 2012/19/EU
- RoHS, Directive 2011/65/EU
- RoHS China, Standard SJ/T 11363-2006
- REACh regulation EC 1907/2006

NOTE: Documentation about sustainable development is available on Schneider Electric website (Product environmental profile and end of life instruction, RoHS and REACh certificates).

End of Life (WEEE)

The product contains electronic boards. It must be disposed of in specific treatment channels. The product contains cells and/or storage batteries which must be collected and processed separately, when they have run out and at the end of product life.

Refer to the section maintenance to extract cells and batteries from the product. These batteries do not contain a weight percentage of heavy metals over the threshold notified by European Directive 2006/66/EC.

Chapter 2
Physical Overview

Subject of this Chapter

This chapter provides a physical overview of the Rack iPC.

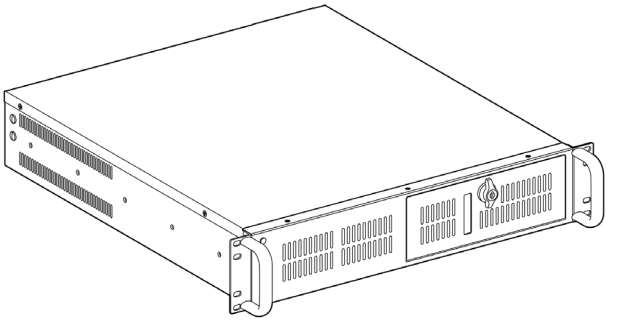
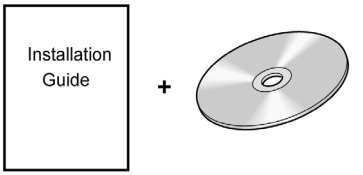
What Is in This Chapter?

This chapter contains the following topics:

Package Contents of the Rack iPC Optimized

Items

The items are included in the Harmony Rack iPC package. Before using the Rack iPC, confirm that all items listed here are present:

<table>
<tr><td>Rack iPC</td><td>Optimized:
  </td></tr>
<tr><td>HMIRXOHCA3W01:
DVD-ROM recovery & documentation (WES7P 64 bits)</td><td rowspan="10"> 
</td></tr>
<tr><td>HMIRSOHPA3W01:
DVD-ROM recovery & documentation (WES7P 32 bits)</td></tr>
<tr><td>Schneider Readme document (A4 format)</td></tr>
<tr><td>HMIRXOHCA3W01 and HMIRSOHPA3W01:
MS EULA _WES7</td></tr>
<tr><td>HMIRXOHCA3W01 and HMIRSOHPA3W01:
Acronis license EULA document</td></tr>
<tr><td>Schneider China RoHS</td></tr>
<tr><td>HMIRXOHCA3W01 and HMIRXOHCA3001:
RXO simplified chinese user manual</td></tr>
<tr><td>HMIRSOHPA3W01:
RSO simplified chinese user manual</td></tr>
</table>

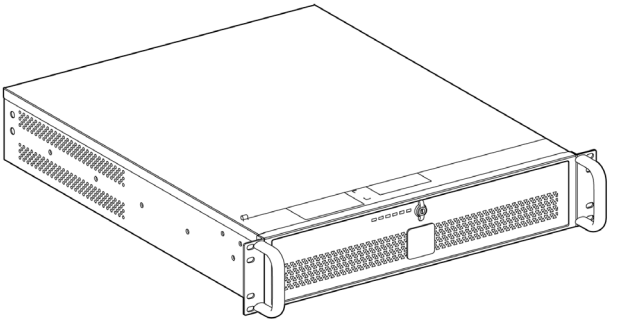
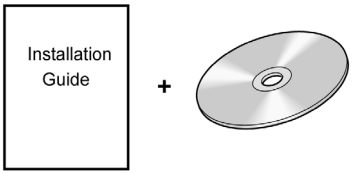
Screw pack x 1 Handles x 2 Key x 2 US power cable x 1 EU power cable x 1	

This unit has been carefully packed, with special consideration to quality. However, should you find anything damaged or missing, contact your local distributor immediately.

Package Contents of the Rack iPC Universal

Items

The items are included in the Harmony Rack iPC package. Before using the Rack iPC, confirm that all items listed here are present:

<table>
<tr><td>Rack iPC</td><td>Universal:
  </td></tr>
<tr><td>DVD-ROM recovery & documentation (Win 7 Ultimate 64 bits)</td><td rowspan="9"> 
</td></tr>
<tr><td>Microsoft Windows 7 DVD collection</td></tr>
<tr><td>HMIRSUS3A3701:
Vijeo Citect DVD</td></tr>
<tr><td>Schneider Readme document (A4 format)</td></tr>
<tr><td>Microsoft Windows EULA document</td></tr>
<tr><td>Acronis license EULA document</td></tr>
<tr><td>Schneider China RoHS</td></tr>
<tr><td>RSU simplified chinese user manual</td></tr>
</table>

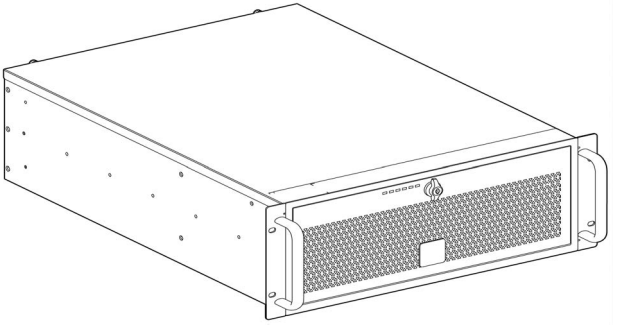
Screw pack x 1 Handles x 2 Key x 2 US power cable x 1 EU power cable x 1	

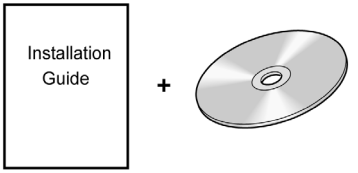
This unit has been carefully packed, with special consideration to quality. However, should you find anything damaged or missing, contact your local distributor immediately.

Package Contents of the Rack iPC Performance

Items

The items are included in the Harmony Rack iPC package. Before using the Rack iPC, confirm that all items listed here are present:

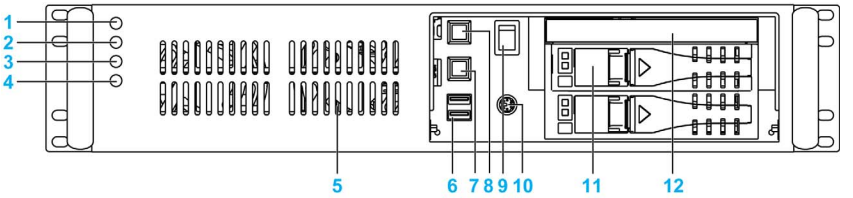
Rack iPC	Performance: 

HMIRSPHXA6701 and HMIRSPHXA67P1 and HMIRSPFXA6701 and HMIRSPFXR6702: DVD-ROM recovery & documentation (Win 7 Ultimate 64 bits) Microsoft Windows 7 DVD collection	
HMIRSPSXR6S01: DVD-ROM recovery & documentation (Win 2008 server) Microsoft Windows server 2008 DVD collection	
HMIRSPFXA6701 and HMIRSPFXR6702: Vijeo Citect DVD	
HMIRSPHXA67P1: PES leaflet	
Schneider Readme document (A4 format)	
Microsoft Windows EULA document	
Acronis license EULA document	
Schneider China RoHS	
RSP simplified chinese user manual	
Screws pack Handles x 2 Key x 2 ● US power cable x 2 and EU power cable x 2 (redundant): HMIRSPFXR6702 HMIRSPSXR6S01 ● US power cable x 1 and EU power cable x 1 (single): HMIRSPHXA6701 HMIRSPHXA67P1 HMIRSPFXA6701	

This unit has been carefully packed, with special consideration to quality. However, should you find anything damaged or missing, contact your local distributor immediately.

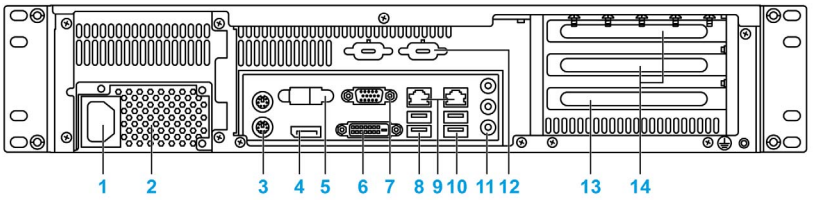
Description of the Rack iPC Optimized

Front View



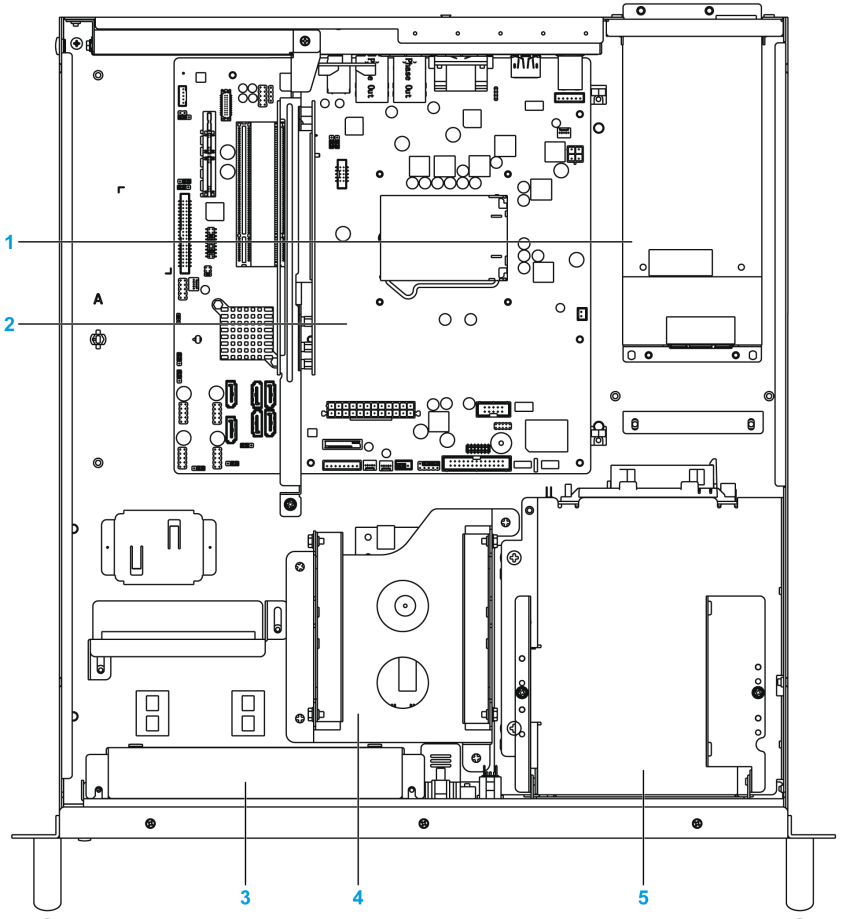
1 Power LED
2 HDD LED
3 Fan LED
4 Temperature LED
5 Fan x 2
6 USB port 2.0 x 2
7 Alarm reset button
8 System reset button
9 Power switch
10 KB/MS connector
11 Hot swap hard disk tray 3.5" (when it is not used with OS) x 2
12 Slim optical drive bay

Rear View



1 Power connector
2 Power supply unit
3 KB/MS connector
4 Display port connector
5 Serial port connector
6 DVI connector
7 VGA connector
8 USB port 3.0 x 2
9 LAN port x 2
10 USB port 3.0 x 2
11 Audio port
12 Spare Sub-D9 housing x 2
13 Expansion slot PCI
14 Expansion slot PCIe (x8/x16) x 2

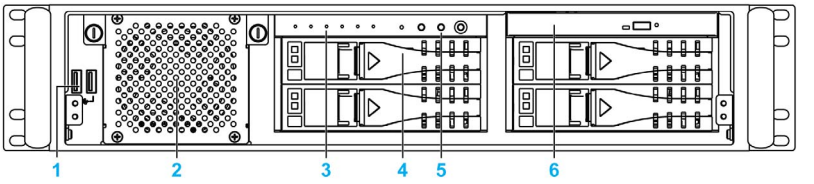
Top View



1 Power supply unit
2 Micro ATX motherboard
3 System fan x 2
4 Internal drive 3.5” SATA 3 for OS
5 Hot swap hard disk tray 3.5" SATA 2 x 2

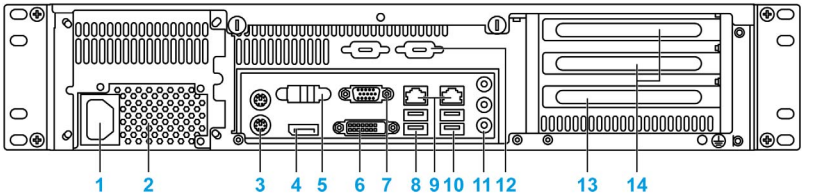
Description of the Rack iPC Universal

Front View



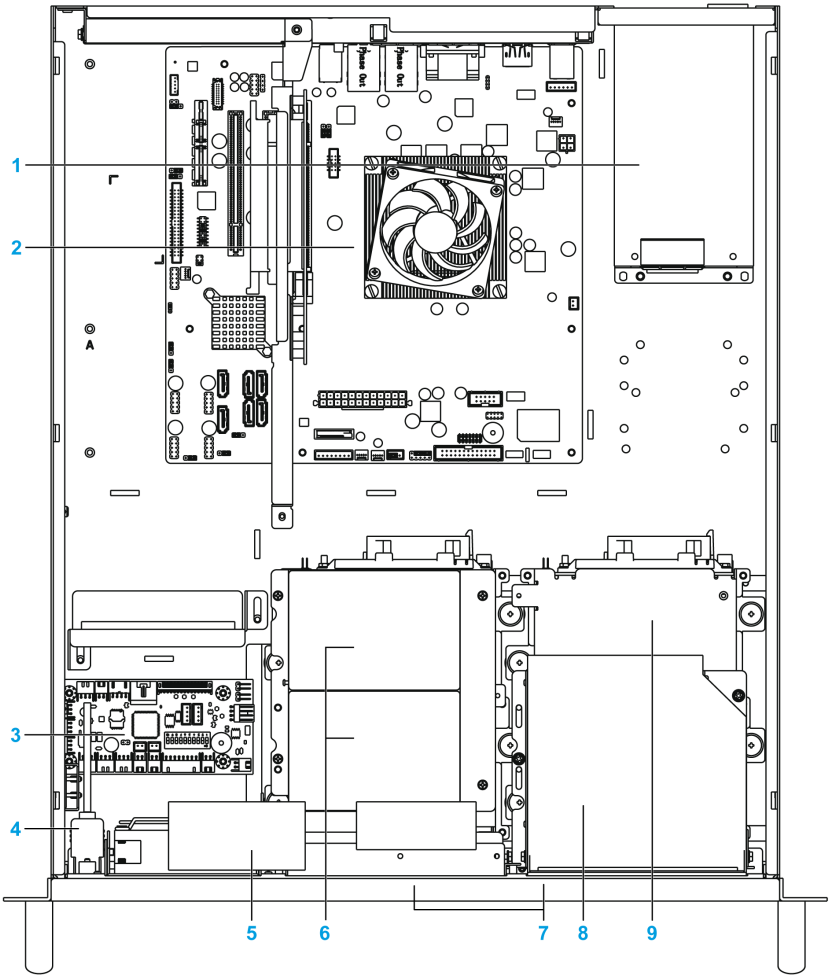
1 USB ports 2.0 x 2
2 Front-accessible fan
3 LED X 5
4 Button x 4
5 Hot swap hard disk tray 3.5" (when it is not used with OS) x 4
6 Slim optical drive

Rear View



1 Power connector
2 Power supply unit
3 KB/MS connector
4 Display port connector
5 Serial port connector
6 DVI connector
7 VGA connector
8 USB port 3.0 x 2
9 LAN port x 2
10 USB port 3.0 x 2
11 Audio port
12 Spare Sub-D9 housing x 2
13 Expansion slot PCI
14 Expansion slot PCIe (x8/x16) x 2

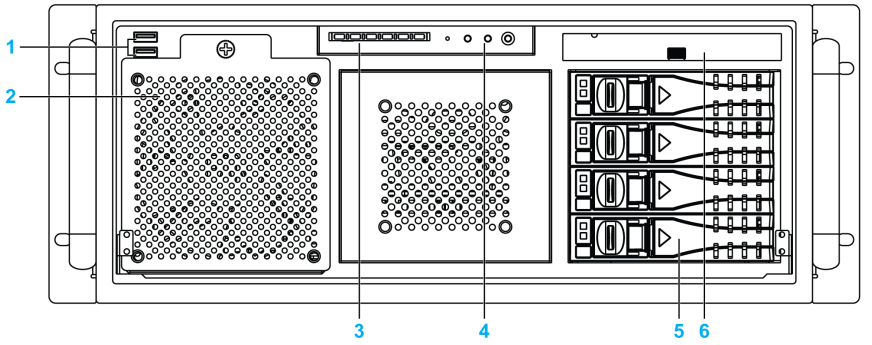
Top View



1 Power supply unit
2 Micro ATX motherboard
3 Alarm board with fan speed control
4 Case-open switch
5 Storage fan kit with thumb screw
6 Internal 2.5” drive bays optional x 2
7 Hot swap hard disk tray 3.5" SATA 2 x 4
8 Slim optical drive
9 Internal drive 3.5” SATA 3 for OS

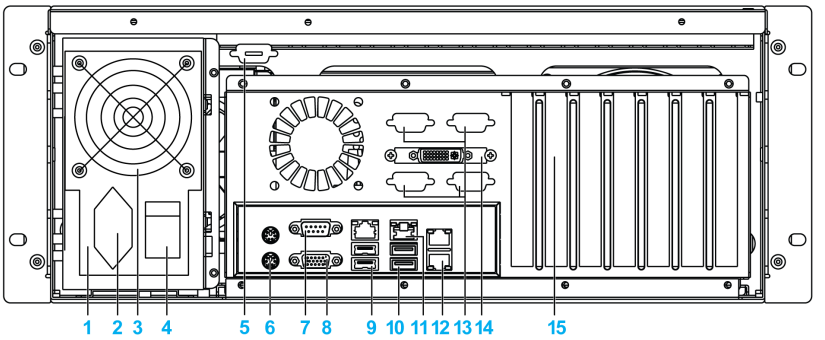
Description of The Rack iPC Performance

Front View



1 USB ports 2.0 x 2
2 Front-accessible fan
3 LED x 6
4 Switch/Button x 4
5 Hot swap hard disk tray 3.5" (when it is not used with OS) x 4
6 Slim optical drive bay

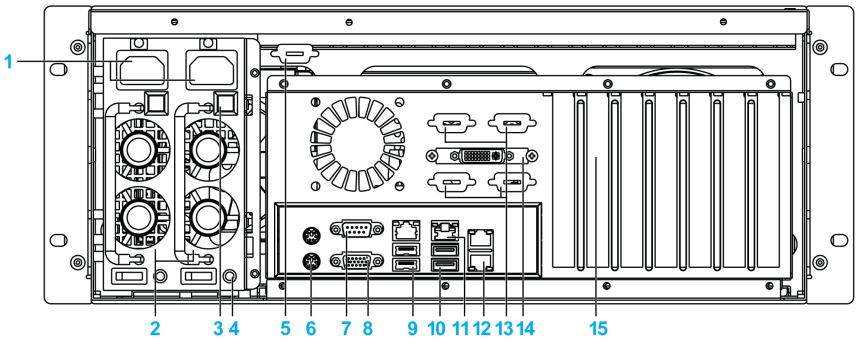
Rear View with Single Power Supply



1 Power supply unit
2 Power supply connector
3 Fan
4 Power supply switch
5 Spare Sub-D9 housing
6 KB/MS connector
7 Serial port connector
8 VGA connector
9 USB port 2.0 x 2

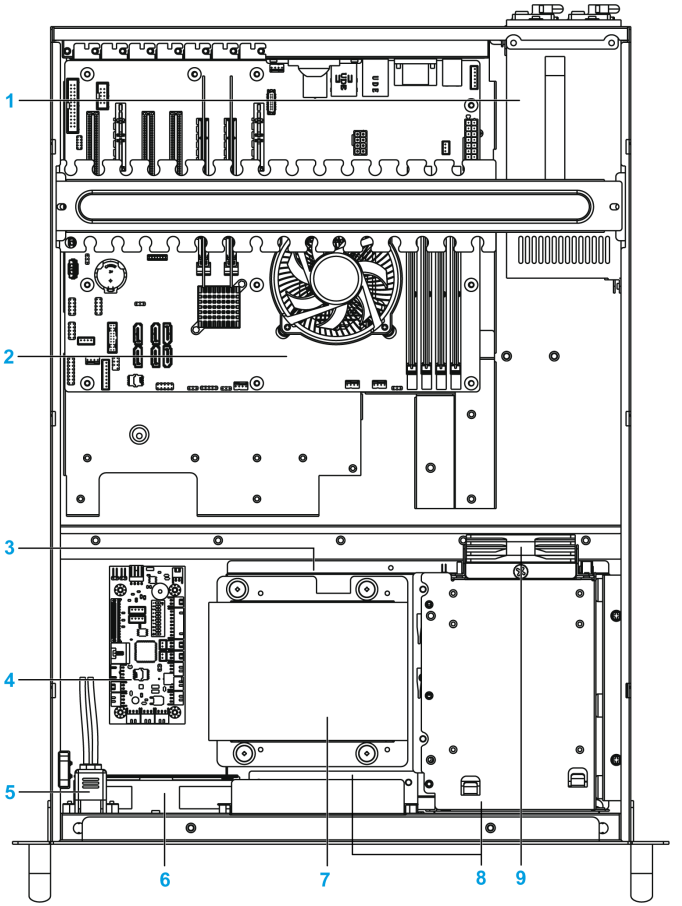
10 USB port 3.0 x 2
11 LAN port x 2
12 Spare LAN port x 2
13 Spare Sub-D9 housing x 4
14 DVI connector
15 Expansion slots (maximum 7): 2 PCIe x4 and 2 PCIe x8/x16 and 3 PCI. By default-mounted audio ports on 1 slot)

Rear View with Redundant Power Supply



1 Power supply connector x 2
2 Power supply unit x 2
3 Button
4 LED
5 Spare Sub-D9 housing
6 KB/MS connector
7 Serial port connector
8 VGA connector
9 USB port 2.0 x 2
10 USB port 3.0 x 2
11 LAN port x 2
12 Spare LAN port x 2
13 Spare Sub-D9 housing x 4
14 DVI connector
15 Expansion slots (maximum 7): 2 PCIe x4 and 2 PCIe x8/x16 and 3 PCI. By default-mounted audio ports on 1 slot

Top View

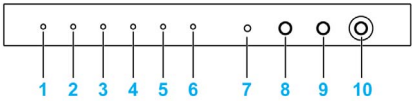


1 Power supply unit
2 ATX motherboard
3 Hard disk
4 Alarm board featuring system fan speed control
5 Case-open switch
6 Front-accessible fan
7 Internal drive SATA 3 3.5” with OS
8 Hot swap hard disk tray 3.5" x 4
9 Storage fan (easy to maintain with the thumb screw)

Rack iPC LED and Push-Button Description

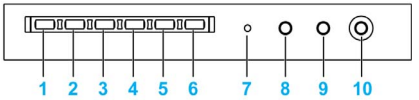
LED Description

The figure shows the LEDs and push-button on the Rack iPC:Universal



1 **[Power]** LED
2 **[Fan]** LED
3 **[Temperature]** LED
4 **[RUN]** LED
5 **[Hard Disk]** LED
6 **[LAN]** LED
7 **[Spare]** button
8 **[ALARM RESET]** button
9 **[SYSTEM RESET]** button
10 **[POWER]** switch

The figure shows the LEDs and push-button on the Rack iPC:Performance



1 **[Power]** LED
2 **[Fan]** LED
3 **[Temperature]** LED
4 **[RUN]** LED
5 **[Hard Disk]** LED
6 **[LAN]** LED
7 **[Spare]** button
8 **[ALARM RESET]** button
9 **[SYSTEM RESET]** button
10 **[POWER]** switch

Status LED

The following table describes the meaning of the status LEDs on the Rack iPC:

LED	Color	Meaning
[Power]	Green	Supply voltage is OK.
	Red	It indicates a redundant power supply module failure. To stop the alarm beep, press the **Alarm Reset** button. Examine the redundant power supply module right away and replace the failed module with a working one.
[Fan]	Green	Fan is OK.
	Red	it indicates a failed cooling fan, and the alarm is also activated. To stop the alarm beep, press the **Alarm Reset** button and then replace the failed fan with a working one immediately.
[Temperature]	Green	Temperature is OK.
	Red	The inside of the chassis is overheated (more than 50 °C). An audible alarm is activated. To stop the alarm beep, press the **Alarm Reset** button. Inspect the fan filter and the rear section of the chassis immediately. Make sure that the airflow inside the chassis is smooth and not blocked by dust or other particles.
[Hard Disk]	Green	Each SATA HDD tray has a pair of LED indicators for displaying the SATA HDD power and the activity status. The system power is on and the SATA HDD is connected well.
	Blue	Data access.
	Red	HDD failure.
[LAN]	Green	If the LAN1/LAN2 LED stays green, it means the network connection works normally. When the data is transmitting through network, the LAN LED turns into blinking.
	–	The LAN1/LAN2 LED fails to light up, inspect the LAN cable and the connection.

Momentary Power Switch

Press the power button with a pointed object (for example, paper clip or tip of a pen).

The power button acts like the On/Off switch on a normal desktop PC with a controller power supply:

- Press and release: switches on the Rack iPC or shuts down the operating system and switches off the Rack iPC.
- Press and hold: controller power supply switches off without shutting down the panel PC (data could be missing!).

Pressing the power button does not reset the processor.

System Reset Button

Press the reset button with a pointed object.

Pushing the reset button triggers a hardware and PCI reset. The Rack iPC restarts cold.

Pressing the reset button does not reset the processor.

Alarm Reset Button

Press the reset button with a pointed object.

Whenever a fault detection occurs in the system (for example, fan failure detection or the chassis is warmed), the audible alarm is activated. Pressing this button stops the alarm from beeping.

Chapter 3
Characteristics

Subject of this Chapter

This chapter lists the product characteristics.

What Is in This Chapter?

This chapter contains the following topics:

Characteristics of the Rack iPC

Product Characteristics

The characteristics of the Rack iPC models are given below:

Element	Characteristics		
	Performance	Universal	Optimized
	Rack PC 4U	Rack PC 2U	
Intel chipset and processor	Intel Xeon™ E3-1225 v2 3.1 GHz L3 cache 8 MB BIOS AMI EFI 64 Mbit SPI	Intel™ Core i3–2120 3.3 GHz L3 cache 3 MB BIOS AMI EFI 64 Mbit SPI	Intel Celeron™ HMIRXO: G540 2.5 GHz HMIRSO: G850 2.9 GHz L3 cache 2 MB BIOS AMI EFI 64 Mbit SPI
Other	ATX motherboard, DVD-RW, 1 serial line and 4 optional, 2 Gigabit Ethernet	Micro ATX motherboard, DVD-RW, 2 serial line and 4 optional, 2 Gigabit Ethernet	
Cooling method	2 x fans	3 x fans	3 x fans
Expansion slot	7 = 1 x PCIe (x1), 1 x PCIe (x4), 2 x PCIe (x8/16) and 3 x PCI	3 = 2 x PCIe (x8/16) and 1 x PCI	
Memory	Dual channel DDR3 1333/1600 MHz SDRAM- 32 GB max/socket 4 x 240-pin DIMM		
	HMIRSPHXA6701: 4 GB HMIRSPFXA6701: 4 GB HMIRSPFXR6701: 4 GB HMIRSPHXA67P1: 8 GB HMIRSPSXR6S01: 8 GB	4 GB	HMIRXO: 2 GB HMIRSO: 4 GB
Default storage drive	HMIRSPHXA6701: HDD (500 GB 24/7) HMIRSPFXA6701: SSD (80 GB) HMIRSPFXR6701: SSD (80 GB) HMIRSPHXA67P1: HDD (500 GB 24/7) HMIRSPSXR6S01: RAID 2 x HDD (500 GB 24/7)	HMIRSUH3A3701: HDD (500 GB 24/7) HMIRSUS3A3701: SSD (80 GB)	HMIRXOHCA3W01: HDD (500 GB consumer) HMIRXOHCA3001: no HMIRSOHPA3W01: HDD (500 GB 24/7)
Storage 3.5"	1 x internal (SATA 3) and 4 x trays (SATA 2)	2 x trays (SATA 2) and 2 x trays (SATA 3)	1 x internal (SATA 3) and 2 x trays (SATA 2)
Graphics	Intel HD graphics 2500	Intel HD graphics	

Element	Characteristics		
	Performance	Universal	Optimized
	Rack PC 4U	Rack PC 2U	
Resolution			
CRT	Supports a maximum resolution of 2048 x 1536 at 60 Hz		
DVI	Supports a maximum resolution of 1920 x 1200 at 60 Hz		
Ethernet			
Interface	10/100/1000 Mbps/s		
Controller	GbE LAN1: Intel 82579LM, GbE LAN2: Intel 82583 V		
Connector	2 x RJ45		
Channel	2/4		
Front			
USB	2 x USB ports 2.0		
Rear			
CRT	1		
DVI	1		
Display port	–	1	
Ethernet	2		
USB	2 x USB ports 3.0 and 2 x USB ports 2.0	4 x USB ports 3.0	
Audio	2 x (Mic-in, line-out)		
Serial	1 x RS-232 4 x RS-232 (optional)	2 x RS-232 3 x RS-232 and 1 x RS-422/485 (optional)	
PS/2	2 (1 x keyboard and 1 x mouse)		
Power supply	500 W (single power supply) Or 500 W (2 x redundant power supply)	300 W (single power supply)	
Watchdog timer			
Output	System reset		
Interval	Programmable 1...255 sec/min		

Environmental Characteristics

Characteristics

The environmental characteristics of the Rack iPC are as follows:

Characteristics	Value	Standards
Degree of protection	IP20	IEC 60529
Operating temperature	Performance: 0...40 °C (32...104 °F) Universal: 0...40 °C (32...104 °F) Optimized: 0...40 °C (32...104 °F)	IEC 60068-2-2
Non-operating temperature	Performance: – 40...70 °C (– 40...156 °F) Universal: –40...70 °C (–40...156 °F) Optimized: –20...60 °C (–4...140 °F)	IEC 60068-2-2
Operation humidity	Performance and Universal: 10...95% at 40 °C, non-condensing Optimized: 10...85% at 40 °C, non-condensing	IEC 60068-2-78
Non-operation humidity	Performance and Universal: 10...95% at 60 °C, non-condensing Optimized: 10...95% at 40 °C, non-condensing	IEC 60068-2-78
Vibration	Random (operating): 0.002 G^2/Hz; 1 Grms; 5...500 Hz; 1 hour per axis (X,Y,Z) Sinus (non-operating): 19.6 m/s^2 (2 gn); 5...500 Hz; 1 octave / min; 1 hour per axis (X, Y, Z)	IEC 60068-2-6
Shock	10 g (With 11 ms duration, half sine wave)	IEC 60068-2-27

Chapter 4
Dimensions/Assembly

Subject of this Chapter

This chapter describes Rack iPC dimensions and installation panels.

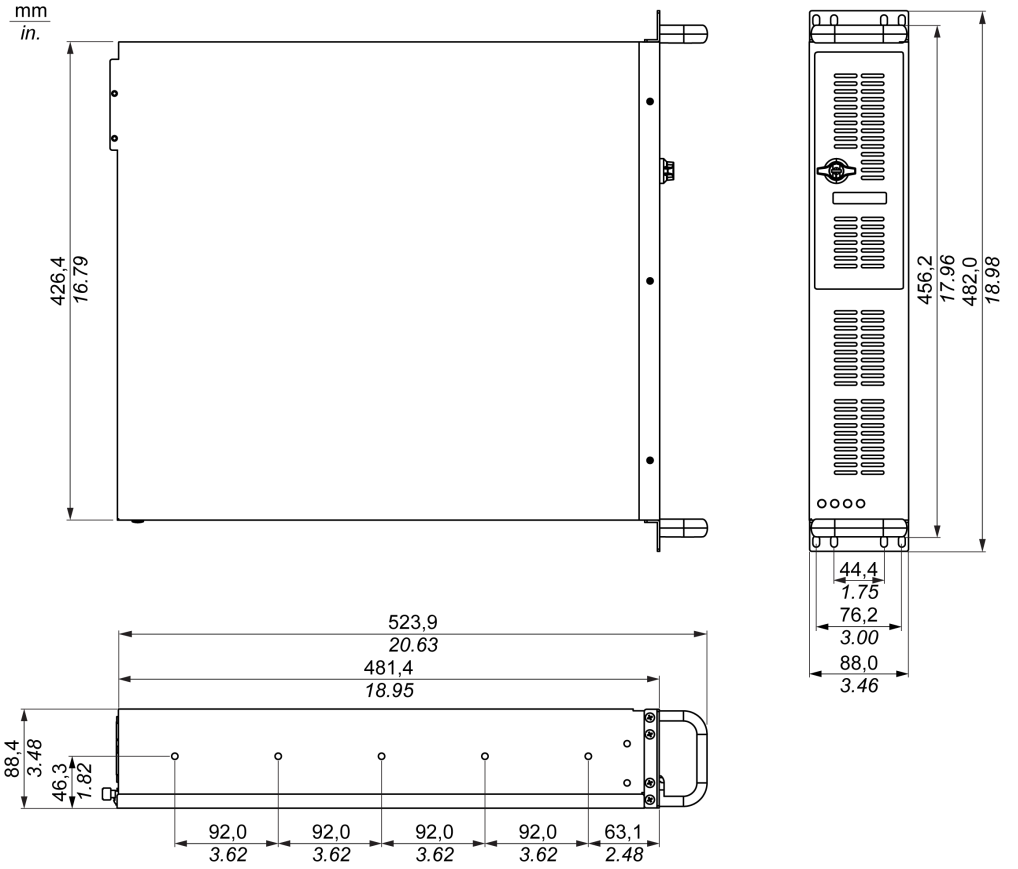
What Is in This Chapter?

This chapter contains the following topics:

Dimensions

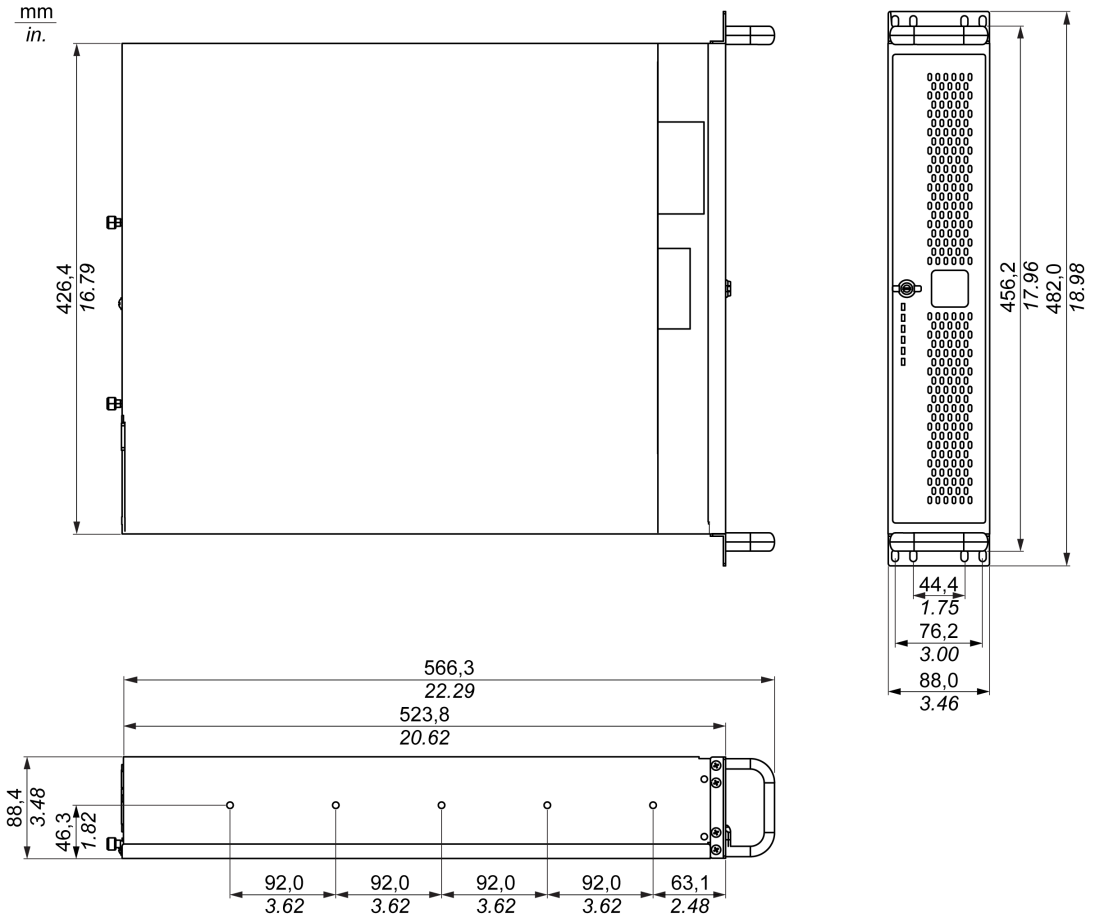
Dimensions of the Optimized Unit

This illustration shows the dimensions:



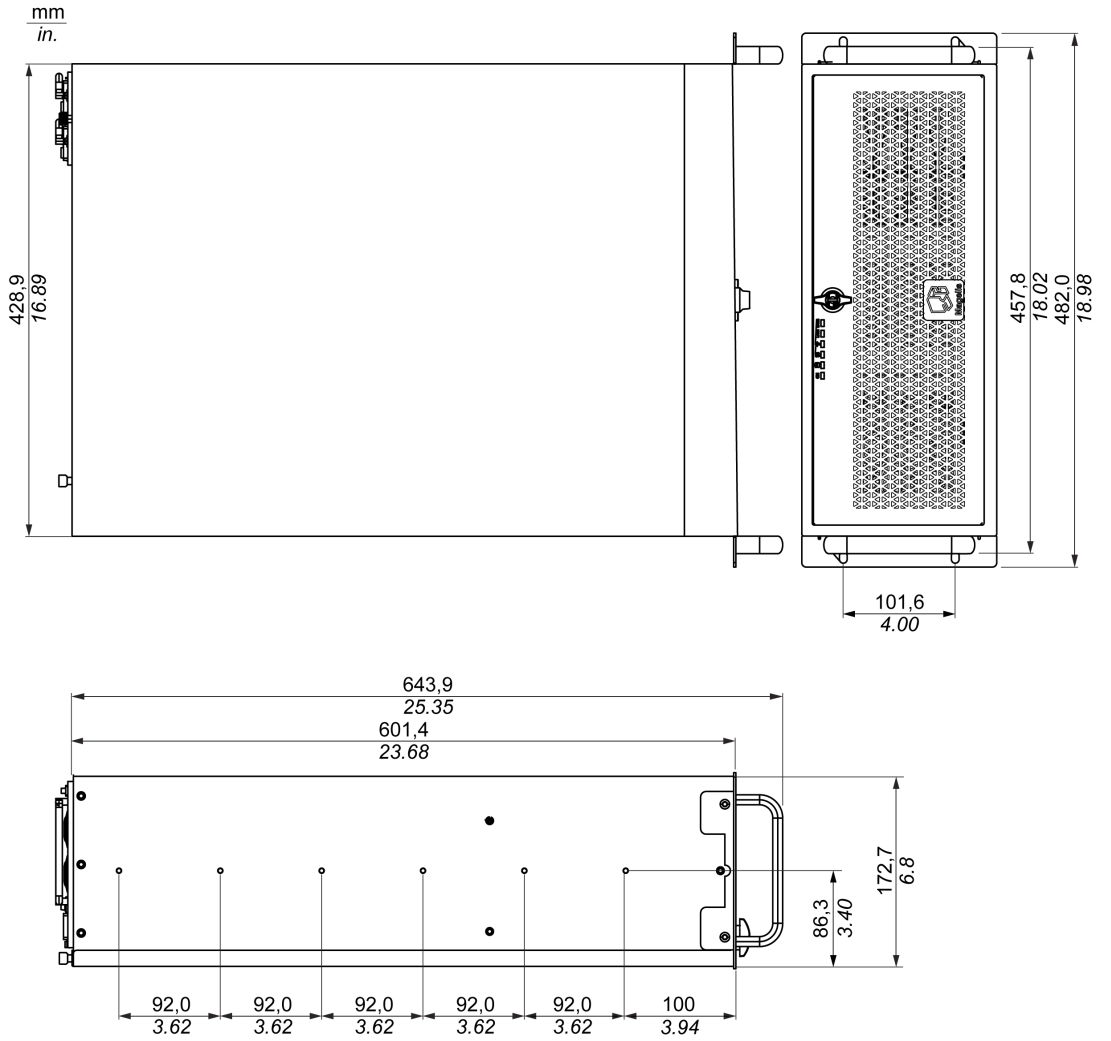
Dimensions of the Universal Unit

The illustration shows the dimensions:



Dimensions of the Performance Unit

The illustration shows the dimensions:



Mounting of the Rack iPC

Installation Location

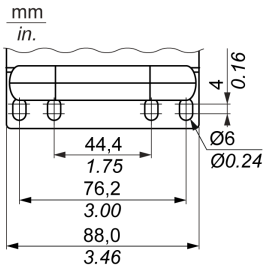
⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

- Do not place the Harmony Industrial PC next to other devices that might cause overheating.
- Keep the Harmony Industrial PC away from arc-generating devices such as magnetic switches and non-fused breakers.
- Avoid using the Harmony Industrial PC in environments where corrosive gases are present.
- Install the Harmony Industrial PC in a location providing a minimum clearance of 50 mm (1.96 in) or more on the left and right sides, and 100 mm (3.93 in) or more above and below the product from all adjacent structures and equipment.
- Install the Harmony Industrial PC with sufficient clearance for cable routing and cable connectors.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

The Rack iPC unit is designed to use M4 screws. These screws are not for mounting the Rack iPC.They are to prevent the Rack iPC from sliding out of the cabinet:



Important Mounting Information

- Environmental Characteristics *(see page 44)*.
- The Rack iPC is permitted for operation in closed rooms only.
- The Rack iPC cannot be situated in direct sunlight.
- The Rack iPC vent holes must not be covered.
- When mounting the Rack iPC, adhere to the allowable mounting angle.
- Be sure that the wall or switching cabinet can support a minimum 4 times the total weight of the Rack iPC.
- When connecting certain cable types (DVI, USB, and so on), keep the flex radius of the cable in mind.

Mounting Angle

The Rack iPC unit must be mounted on 19” rack.

Preparing to Install the Rack iPC

Vibration and Shocks

Extra care should be taken with respect to vibration levels when installing or moving the Rack iPC. If the Rack iPC is moved, for example, while it is installed in a rack equipped with caster wheels, the unit can receive excessive shock and vibration.

⚠ CAUTION

EXCESSIVE VIBRATION

- Plan your installation activities so that shock and vibration tolerances in the unit are not exceeded.
- The recommended torque for mounting the Harmony Industrial PC is 0.5 Nm (4.5 lb-in).

Failure to follow these instructions can result in injury or equipment damage.

Part II
Implementation

Subject of this Part

This part describes setting up the product.

What Is in This Part?

This part contains the following chapters:

Chapter 5
Getting Started

First Power Up

License Agreement

Limitations on your usage of the Microsoft Windows operating system are noted in Microsoft's End User License Agreement (EULA). This EULA is included on the DVD-ROM. Read this document before first powering-up.

On first power-up of your Rack iPC, to customize and set the parameters for your system, refer to the Harmony installation guide.

Chapter 6
Rack iPC Connections

Subject of This Chapter

This chapter describes the connection of the Rack iPC to the main power supply. It also describes the USB ports and identifies the serial interface pin assignments.

What Is in This Chapter?

This chapter contains the following topics:

Grounding

Overview

The grounding resistance between the Rack iPC ground and the ground must be 100 Ω or less. When using a long grounding wire, check the resistance and, if required, replace a thin wire with a thicker wire and place it in a duct. Refer to the table below for maximum lengths of wire with the given cross-section.

Ground Wire Dimensions

Wire cross-section	Maximum line length
2.5 mm^2 (AWG 13)	30 m (98 ft)
	60 m (196 ft) round trip

Dedicated Ground

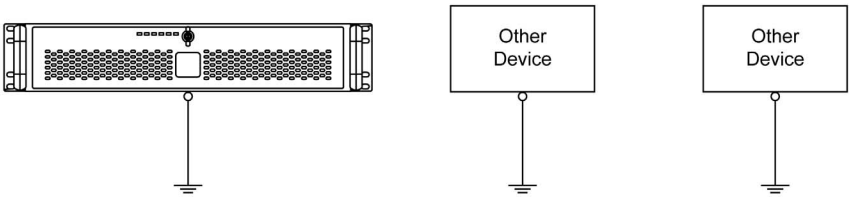
⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

- Use only the authorized grounding configurations shown below.
- Confirm that the grounding resistance is 100 Ω or less.
- Test the quality of your ground connection before applying power to the device. Excessive noise on the ground line can disrupt operations of the Harmony Industrial PC.

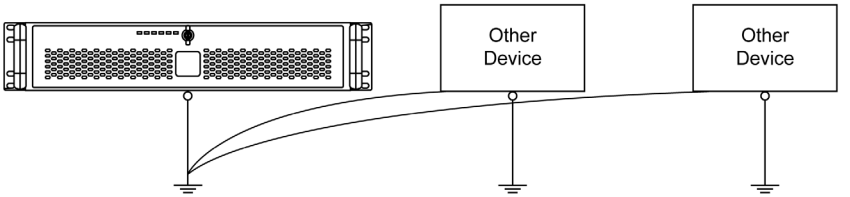
Failure to follow these instructions can result in death, serious injury, or equipment damage.

Connect the Rack iPC ground to a dedicated ground:



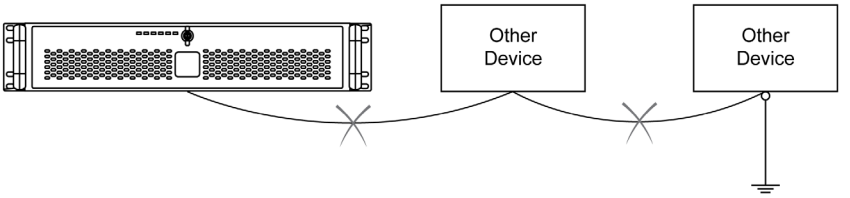
Shared Ground Allowed

If a dedicated ground is not possible, use a shared ground:



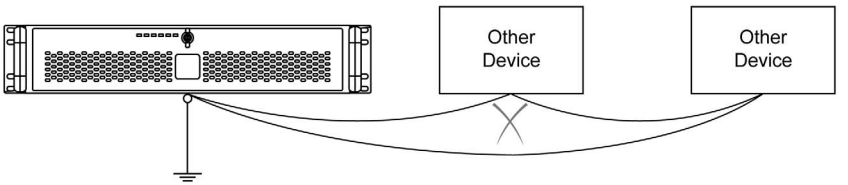
Shared Ground Not Allowed

Do not connect the Rack iPC to ground through other devices:



Shared Ground - Avoid Ground Loop

When connecting an external device to a Rack iPC with the shield ground (SG), ensure that a ground loop is not created. The Rack iPC's ground connection screw and SG are connected internally.



Grounding I/O Signal Lines

Electromagnetic radiation may interfere with the control communications of the Harmony Industrial PC.

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

- If wiring of I/O lines near power lines or radio equipment is unavoidable, use shielded cables and ground one end of the shield to the Harmony Industrial PC ground connection screw.
- Do not wire I/O lines in proximity to power cables, radio devices, or other equipment that may cause electromagnetic interference.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Connecting the AC Power Cord

Precaution

When connecting the power cord to the power connector on the Rack iPC, first ensure that the power cord is disconnected from the AC power supply.

⚠ ⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

- Remove all power from the device before removing any covers or elements of the system, and prior to installing or removing any accessories, hardware, or cables.
- Unplug the power cable from both the Harmony Industrial PC and the power supply.
- Always use a properly rated voltage sensing device to confirm that power is off.
- Replace and secure all covers or elements of the system before applying power to the unit.
- Use only the specified voltage when operating the Harmony Industrial PC. The AC unit is designed to use 100...240 Vac input.

Failure to follow these instructions will result in death or serious injury.

⚠ WARNING

EQUIPMENT DISCONNECTION OR UNINTENDED EQUIPMENT OPERATION

- Ensure that power, communication, and accessory connections do not place excessive stress on the ports. Consider the vibration in the environment.
- Securely attach power, communication, and external accessory cables to the panel or cabinet.
- Use only D-Sub 9-pin connector cables with a locking system in good condition.
- Use only commercially available USB cables.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Connecting the Power Cords

The Rack iPC HMIRSPFXR6702 and HMIRSPSXR6S01 have 2 power cords.

Replacing a Redundant Power Supply

Overview

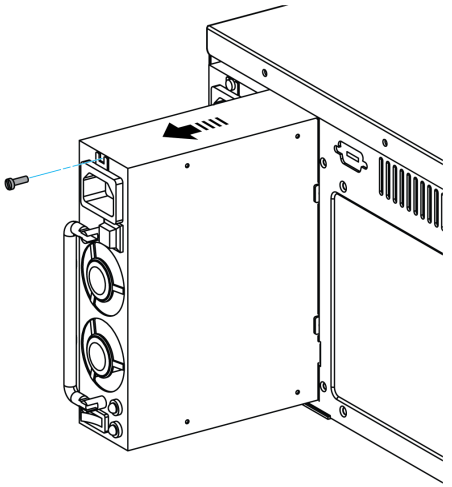
The power supply modules are hot swappable. Hot swapping a power supply is the process of inserting and extracting a power supply from an operating power system.

Replacement Procedure

AC power supply is connected separately to each module. Up to two power supplies may be on a single AC power source:

- Extraction: The AC power is disconnected from the power supply first and then the power supply is extracted from the subsystem. This could occur in standby mode or powered on mode.
- Insertion: The module is inserted into the cage and then AC power is connected to the power supply module.

Use this procedure to replace an inoperative redundant power supply:

Step	Action
1	Use the power switch to turn off the inoperative power supply module.
2	When the LEDs are no longer lit, unplug their power cord.
3	Remove the screw above the module.
4	Use the handle to slide out the module: 
5	Verify that the new power supply module has the same rating as the power supply module that was removed.
6	Slide the new power supply inward until it locks into position.
7	Fold the handle against the module.

Step	Action
8	Replace the screw.
9	Plug in the power cord.
10	Turn on the new power supply module.

Power Supply LED Indicators

There are two LEDs to indicate the power supply status. When AC is applied to the power supply module and standby voltages are available the green LED turn-on to indicate that all the power outputs are available. The amber LED turns-on to indicate that the power supply has declined.

Event	Green led	Amber led
No AC power plug-in	OFF	Flashing
AC OK and power turn-off	Flashing	OFF
AC OK and power turn-off and no failure	ON	OFF
AC OK and power turn-off and failure event	OFF	Flashing
AC OK and power turn-off and warning event	Flashing	Flashing

Alarm Sound (RESET Button)

This is an alarm to report the one of the single modules is declined or without the internal signal in redundant mode. It is to sound the alarm until the internal signal returns or push the RESET button.

Chapter 7
Configuration of the Boot

What Is in This Chapter?

This chapter contains the following topics:

BIOS Options

General Information

BIOS stands for **Basic Input Output System**. It is the most basic communication between the user and the hardware. The BIOS used in the Rack iPC is produced by Schneider Electric.

The **BIOS Setup Utility** lets you modify basic system configuration settings. These settings are stored in CMOS and in an EEPROM (as a backup).

BIOS Setup and Boot Procedure

BIOS is immediately activated when switching on the power supply of the Rack iPC or pressing the power button. The system checks if the setup data from the EEPROM is valid. If the data is valid, then it is transferred to CMOS. If the data is not valid, then the CMOS data is checked for validity. A message appears if the CMOS data contains anomalies, but you can continue the boot procedure by pressing the [F1] key.

NOTE: To prevent the message from appearing at each restart, open the BIOS setup by pressing the [DEL] key and save the settings again.

BIOS reads the system configuration information in CMOS RAM, checks the system, and configures it using the **Power On Self Test** (POST).

When these preliminaries are complete, the BIOS boots the operating system from the data storage devices available (hard drive, floppy drive, and so on). The BIOS launches the operating system and hands over the control of system operations to the operating system.

Entering BIOS Setup

For enter BIOS setup, press **DEL** or **F2** key after the Rack iPC has been initialized.

BIOS Setup Keys

The following keys are enabled during the POST:

Key	Function
DEL	Enters the BIOS setup menu
F12	Using the [F12] key, you can boot from the network.
F11	Displays the **Main** boot menu, which lists all bootable devices that are connected to the system. Use the up cursor ↑ and down cursor ↓ and then press the [Enter] key to select the boot device.
Pause	Pressing the [Pause] key stops the POST. Press any other key to resume the POST.

NOTE: Keys input from the USB keyboard is only registered after the USB controller has been initialized.

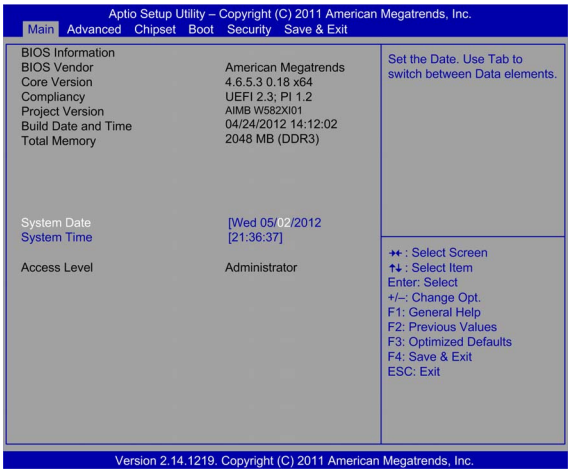
You can use the following keys after entering the BIOS setup:

Key	Function
F1	General help
Cursor ↑	Moves to the previous item
Cursor ↓	Goes to the next item
Cursor ←	Moves to the previous item
Cursor →	Goes to the next item
+ or -	Changes the value of the selected item
Enter	Changes to the selected menu
F2	Previous values
F3	Optimized defaults
F4	Saves and closes BIOS setup
Esc	Exits the submenu

Main Menu

Main Tab

When you enter the BIOS *(see page 66)* during startup, the Rack iPC **Main** BIOS setup menu appears:



This screen, like all the BIOS screens, is divided into three frames:

- Left
  This frame displays the options available on the screen.
- Upper right
  This frame gives a description of the user selected option.
- Lower right
  This frame displays how to move to other screens and the screen edit commands.

This table shows the **Main** menu options that can be set by you:

BIOS setting	Description
Compliancy	Optimized: UEFI 2.3; PI 1.2 Universal: UEFI 2.3; PI 1.2 Performance: UEFI 2.3
Project Version	Optimized: Schneider W582XK04 Universal: Schneider W582XJ05 Performance: Schneider S782XF05
Total Memory	Optimized: 2048 MB (DDR3) Universal: 4096 MB (DDR3) Performance: 4096 MB (DDR3)

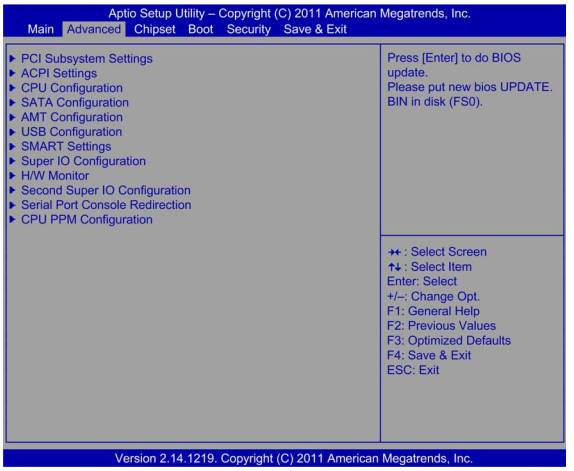
BIOS setting	Description
System Time	This is the current time setting. The time must be entered in HH:MM:SS format. The time is maintained by the battery (CMOS battery) when the unit is turned off.
System Date	This is the current date setting. The date must be entered in MM/DD/YY format. The time is maintained by the battery (CMOS battery) when the unit is turned off.

NOTE: The grayed-out options on all BIOS screens cannot be configured. The blue options can be configured by you.

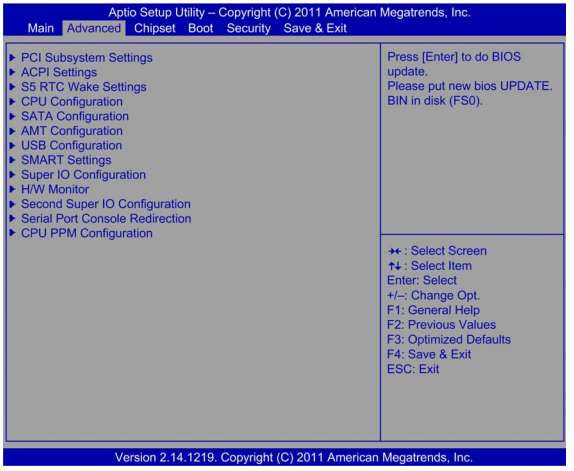
Advanced Menu

Advanced BIOS Features Tab

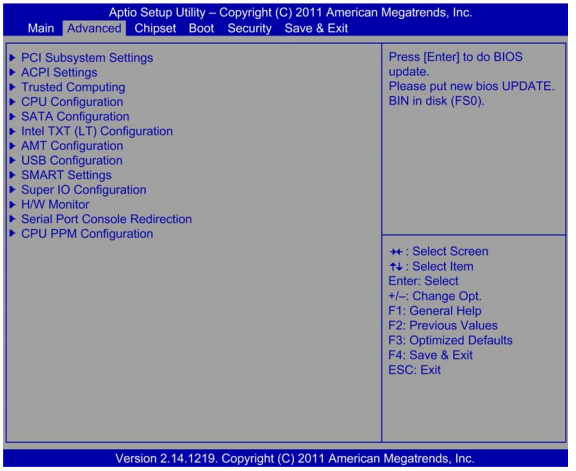
The **Advanced** tab screen for the Rack iPC Optimized:



The **Advanced** tab screen for the Rack iPC Universal:



The **Advanced** tab screen for the Rack iPC Performance:



For details about the **Advanced** submenus, refer to:

- PCI Subsystem Settings *(see page 72)*
- ACPI Settings *(see page 73)*
- Trusted Computing *(see page 74)*
- S5 RTC Wake Settings *(see page 75)*
- CPU Configuration *(see page 76)*
- SATA Configuration *(see page 77)*
- Intel TXT Configuration *(see page 79)*
- AMT Configuration *(see page 80)*
- USB Configuration *(see page 81)*
- SMART Settings *(see page 82)*
- Super I/O Configuration *(see page 82)*
- AOAC Configuration *(see page 85)*
- H/W Monitor *(see page 85)*
- Second Super I/O Configuration *(see page 86)*
- Serial Port Console Redirection *(see page 89)*
- CPU PPM Configuration *(see page 90)*

Rack iPC BIOS Update

Use this procedure to update (flash) the BIOS:

Step	Action
1	Save the new BIOS on a USB pen drive.
2	Rename the BIOS file to “update.bin”.
3	Plug the pen drive into the Rack iPC.
4	Enter the BIOS setup.
5	In this menu, select the Rack iPC **BIOS update** option. **Result:** The BIOS is automatically updated to the new version.

PCI Subsystem Settings Submenu

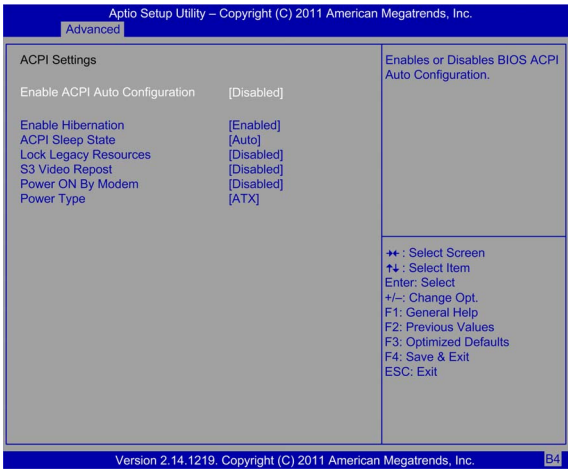
The **PCI Subsystem Settings** submenu:

This table shows the **PCI Subsystem Settings** option:

BIOS setting	Description
Above 4G Decoding	Enables or disables 64-bit capable devices to be decoded on above 4 G address space if the system supports 64-bit PCI decoding.

ACPI Settings Submenu

The **ACPI Settings** (Advanced configuration and power interface) submenu:



This table shows the **ACPI Settings** options:

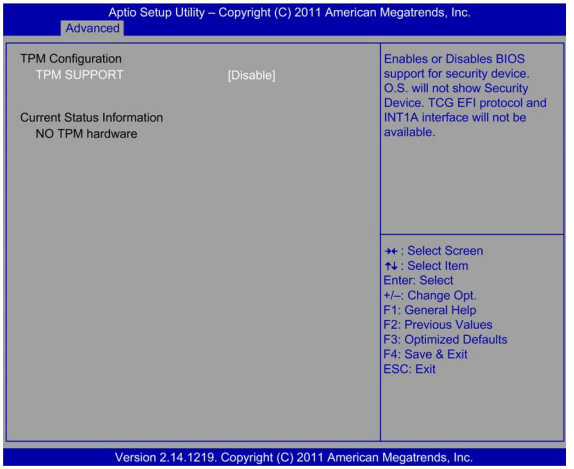
BIOS setting	Description
Power On By Modem	Enables or disables the power-on by modem.
Enable Hibernation	Enables or disables hibernation.
ACPI Sleep State	Optimized: **Auto** Universal: **Auto** Performance: **S3 only (Suspend to RAM)**
Lock Legacy Resources	Locks legacy resources of the devices.
S3 Video Report	Optimized: **Enables or disables S3 resume for VBIOS.** Universal: **Enables or disables S3 resume for VBIOS.**
PowerOn by Modem	The system can be awakened from an ACPI sleep by a wake-up signal from a modem that supports this signal.
Power Type	Optimized: **ATX** Universal: **ATX**

Trusted Computing Submenu

This submenu enables/disables the TPM (TPM 1.1/1.2) setup in BIOS.

The TPM (Trusted platform module) is a secure key generator and key cache management component that enables protected storage of encryption keys and authentication credentials for enhanced security capabilities.

The **Trusted Computing** submenu:

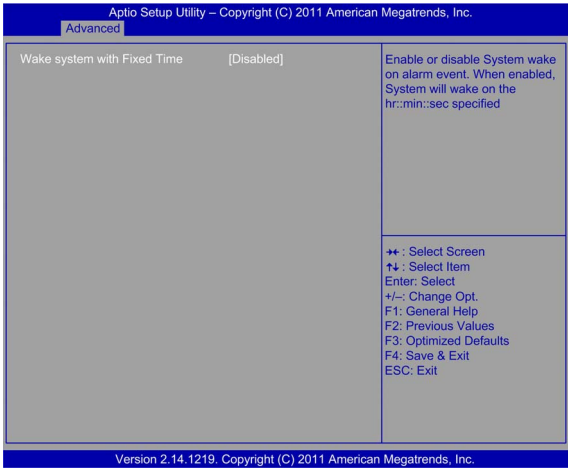


This table shows the **Trusted Computing** option:

BIOS setting	Description
TM Support	Enables or disables TPM if the TPM module is installed on the motherboard.

S5 RTC Wake Settings Submenu

The **S5 RTC Wake Settings** submenu:

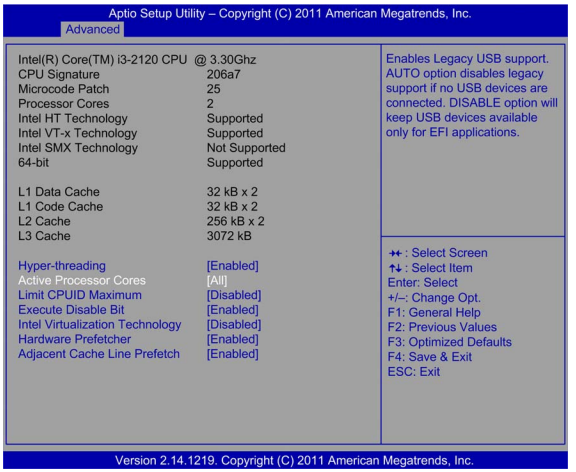


This table shows the **S5RTC Wake Settings** options:

BIOS setting	Description
Wake System with Fixed Time	Enables or disables system wake-up on an alarm after a fixed time.
Wake System with Dynamic Time	Enables or disables system wake-up on an alarm after a dynamic time.

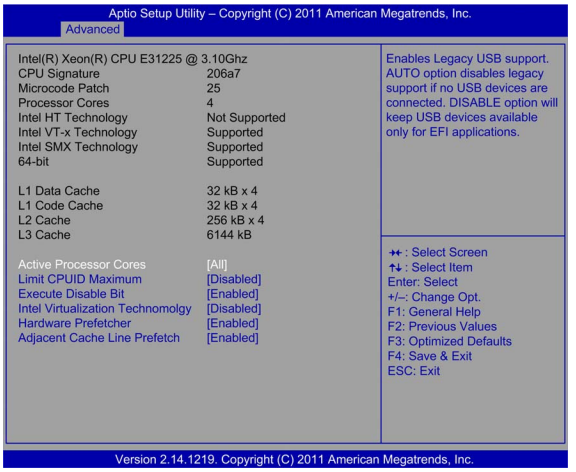
CPU Configuration Submenu

The **CPU Configuration** submenu for the Rack iPC Universal and Optimized:



Universal Intel(R) Core(TM) i3-2120 CPU @ 3.30 GHz
Optimized Intel(R) Pentium(R) CPU G850 @ 2.90 GHz

The **CPU Configuration** submenu for the Rack iPC Performance:

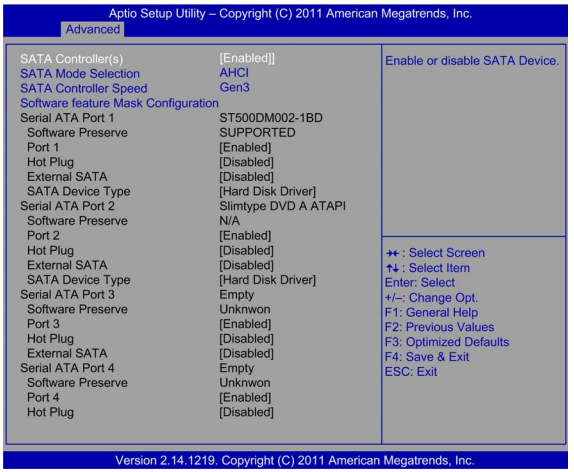


This table shows the **CPU Configuration** options:

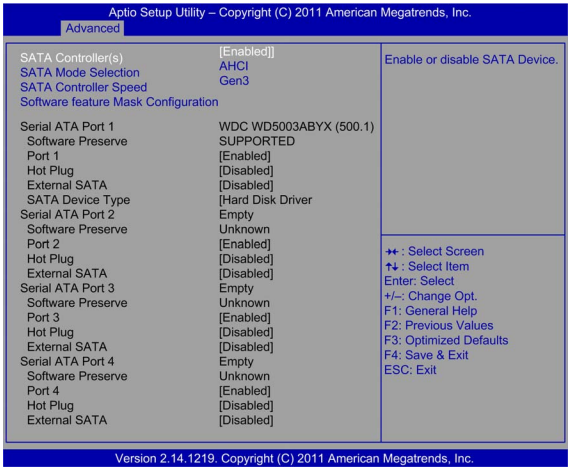
BIOS setting	Description
Active Processor Cores	Allows choosing the number of CPU cores to activate in each processor package.
Limit CPUID Maximum	Allows limiting the CPUID maximum value. If enabled, legacy operating systems can boot without support for CPUs with extended CPUID functions.
Execute Disable Bit	Enables or disables the no-execution page protection technology.
Intel Virtualization Technology	Intel virtualization technology (Intel VT) is a set of hardware enhancements to Intel server and client platforms that provide software-based virtualization solutions. Intel VT allows a platform to run multiple operating systems and applications in independent partitions, therefore, allowing one computer system to function with multiple operating systems.
Hardware Perfectcher	The processor fetches data and instructions (that are likely to be required soon) from the memory into the cache. This reduces the latency associated with memory reads.
Adjacent Cache Line Prefectch	Enables or disables the adjacent cache line prefetch feature.

SATA Configuration Submenu

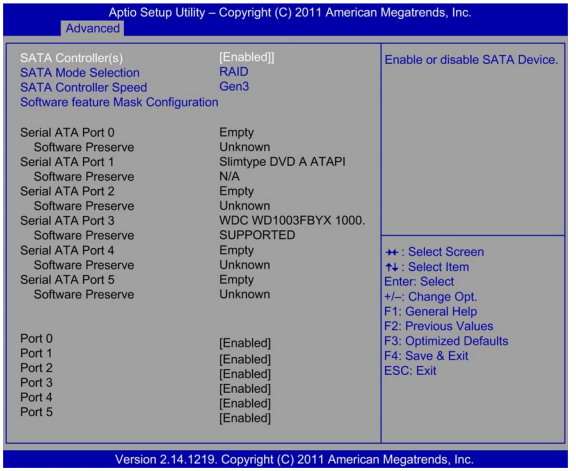
The **SATA Configuration** submenu for Optimized Rack iPC:



The **SATA Configuration** submenu for Universal Rack iPC:



The **SATA Configuration** submenu for Performance Rack iPC:

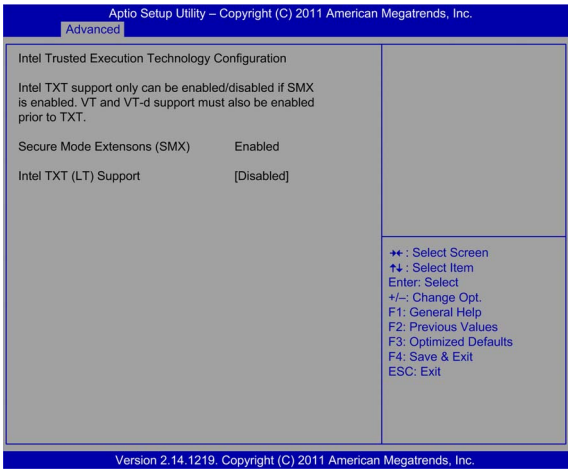


This table shows the **SATA Configuration** options:

BIOS setting	Description
SATA Controller(s)	Enables or disables the SATA function. **NOTE:** This option is only available if **SATA Mode Selection** is set to **IDE**.
SATA Mode Selection	Universal: The SATA mode can be either **IDE** or **AHCI**.

Intel TXT Configuration Submenu

The **Intel TXT Configuration** (Intel trusted execution technology configuration) submenu:

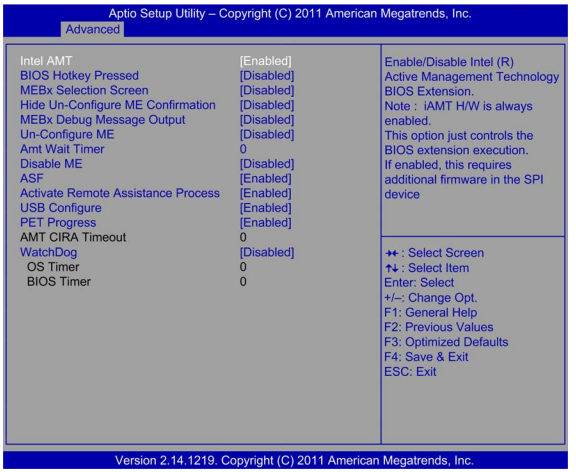


This table shows the **Intel TXT Configuration** options:

BIOS setting	Description
Secure Mode Extension (SMX)	Enables or disables the Intel secure mode extensions (SMX) technology.
Intel TXT Configuration	Enables or disables the Intel trusted execution technology. **NOTE:** This option is only available if the following Intel technologies are enabled: ● Secure mode extensions (SMX) ● Virtualization technology (VT) ● Virtualization for directed I/O (VT-d)

AMT Configuration Submenu

The **AMT Configuration** (Intel active management technology configuration) submenu:

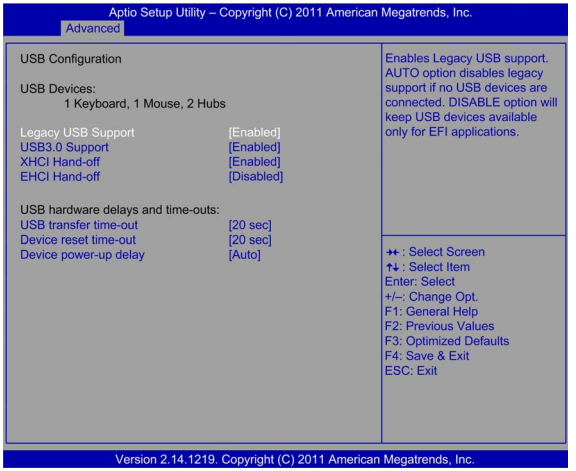


This table shows the **AMT Configuration** options:

BIOS setting	Description
Intel AMT	Enables or disables the Intel AMT BIOS extensions.
Un-Configure ME	When disabled, ATM/ME can be unconfigured without a password. When enabled, this action requires a password.
Watchdog	When set to **Enabled**, the watchdog timer monitors the time taken for each task performed by a software or hardware: ● OS timer [0] ● BIOS timer [0]

USB Configuration Submenu

The **USB Configuration** submenu:



This table shows the **USB Configuration** options:

BIOS setting	Description
USB Devices:	1 keyboard, 1 mouse, 2 hubs.
Legacy USB Support	Enables support for legacy USB. The **Auto** option disables legacy support if no USB devices are connected.
USB 3.0 Support	–
XHCI Hand-off	–
EHCI Hand-Off	This is a work-around for the OS without EHCI hand-off support.
Device reset time-out	Sets USB mass storage to reset time-out value of the device.
Mass Storage Devices	Displays USB mass storage device information.

SMART Settings Submenu

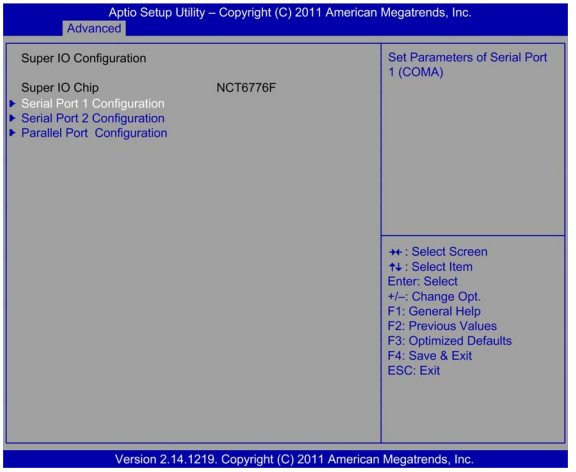
The **SMART Settings** submenu:

This table shows the **SMART Settings** option:

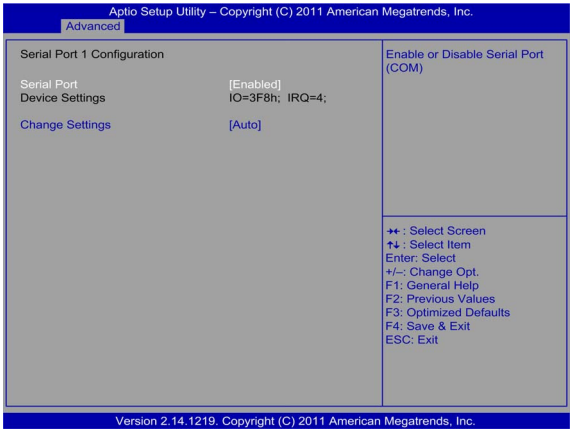
BIOS setting	Description
SMART Self Test	–

Super I/O Configuration Submenu

The **Super I/O Configuration** submenu:



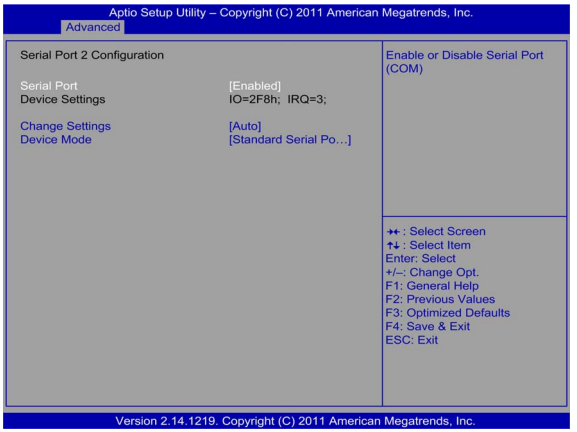
Serial Port 1 Configuration submenu:



This table shows the **Serial Port 1 Configuration** options:

BIOS setting	Description
Serial Port	Enables or disables serial port 1.
Change Settings	Selection of the optional settings for serial port 1.

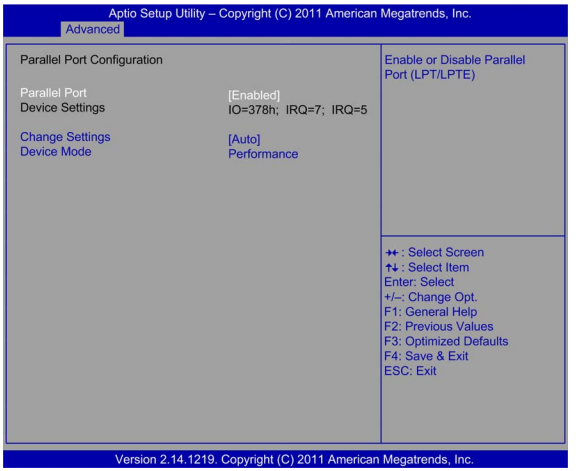
Serial Port 2 Configuration submenu:



This table shows the **Serial Port 2 Configuration** options:

BIOS setting	Description
Serial Port	Enables or disables serial port 2.
Change Settings	Selection of the optional settings for serial port 2.
Device Mode	Serial port 2 choices: ● Standard serial port mode [Default] ● IrDA 1.0 (HP SIR) mode ● ASKIR mode Performance: **STD Printer Mode**

Parallel Port Configuration submenu:

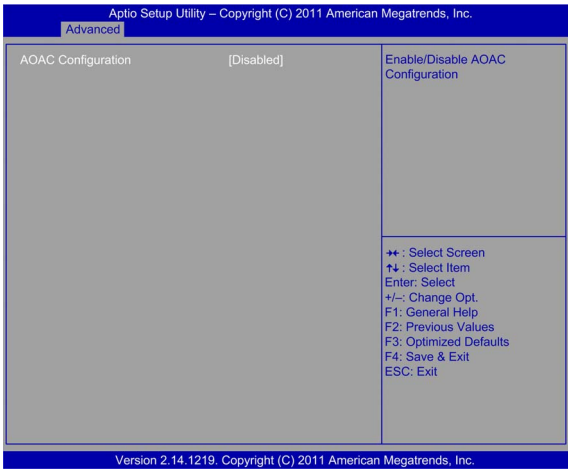


This table shows the **Parallel Port Configuration** options:

BIOS setting	Description
Parallel Port	Enables or disables the parallel port.
Change Settings	Selection of the optional settings for the parallel port.
Device Mode	Parallel port choices. Optimized: **Auto** Universal and Performance: **ECP and EPP 1.9 Mode**

AOAC Configuration Submenu

The **AOAC Configuration** (Always-ON/Always connected) option screen:

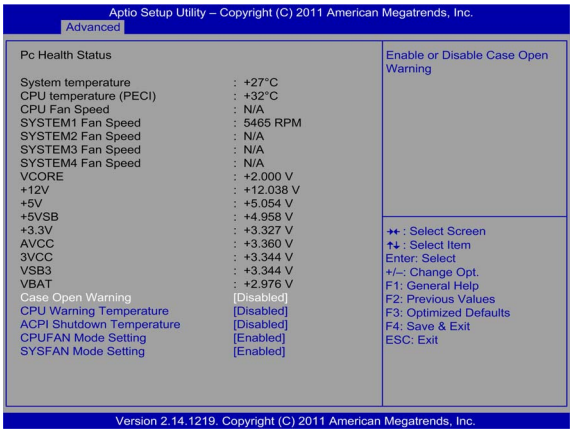


This table shows the **AOAC Configuration** menu options:

BIOS setting	Description
AOAC Configuration	Enables or disables the AOAC function.

H/W Monitor Submenu

The **H/W Monitor** submenu:

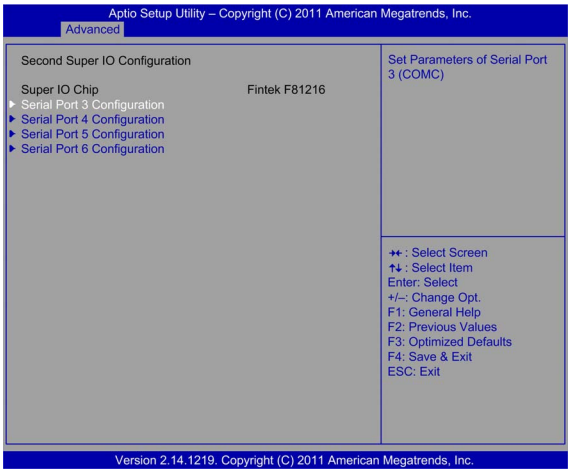


This table shows the **H/W Monitor** options:

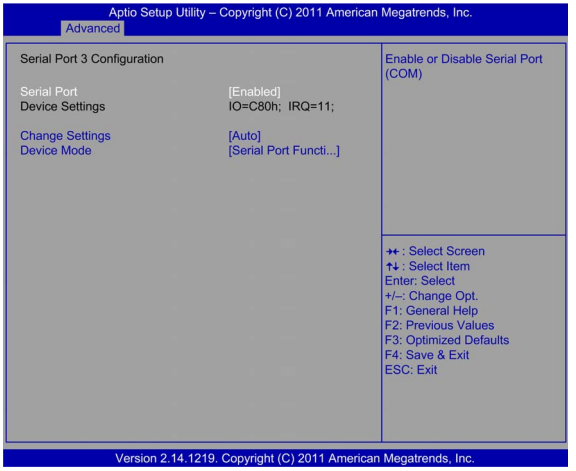
BIOS setting	Description
Case Open Warning	Enables or disables the chassis intrusion monitoring function. When enabled, if the case is opened, the speaker beeps.
CPU Warning Temperature	Sets the CPU informing temperature threshold. If the system reaches the informing temperature, the speaker beeps.
ACPI Shutdown Temperature	Sets the ACPI shutdown temperature threshold. If the system reaches the shutdown temperature, it is automatically shut down by the ACPI OS to protect the system from overheating damage.
CPUFAN Mode Setting	Enables or disables the CPUFAN mode to SMART FAN.
SYSFAN Mode Setting	Enables or disables the SYSFAN mode to SMART FAN.

Second Super I/O Configuration Submenu

The **Second Super I/O Configuration** submenu:



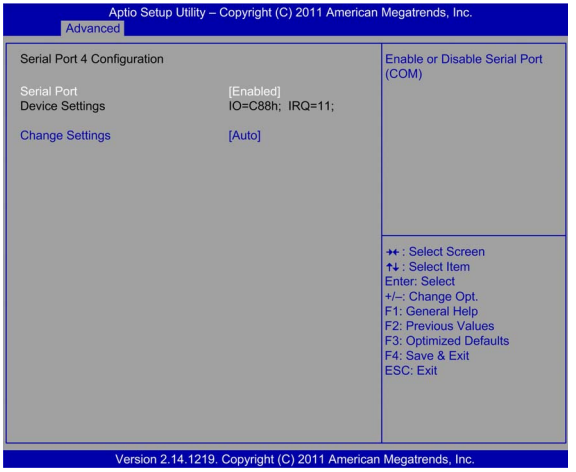
Serial Port 3 Configuration submenu:



This table shows the **Serial Port 3 Configuration** options:

BIOS setting	Description
Serial Port	Enables or disables serial port 3.
Change Settings	Selection of the optional settings for serial port 3.
Auto Flow Control	When COM is to set as RS-485, this port supports auto flow control function.

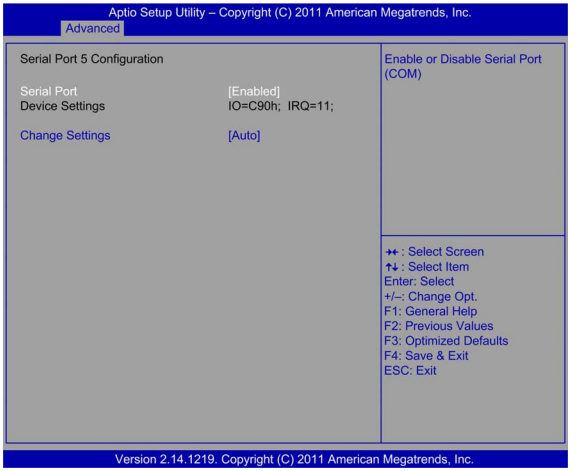
Serial Port 4 Configuration submenu:



This table shows the **Serial Port 4 Configuration** options:

BIOS setting	Description
Serial Port	Enables or disables serial port 4.
Change Settings	Selection of the optional settings for serial port 4.

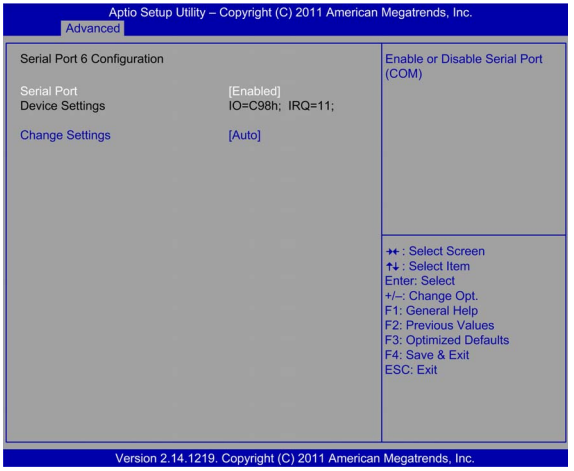
Serial Port 5 Configuration submenu:



This table shows the **Serial Port 5 Configuration** options:

BIOS setting	Description
Serial Port	Enables or disables the serial port 5.
Change Settings	Selection of the optional settings for the serial port 5.

Serial Port 6 Configuration submenu:

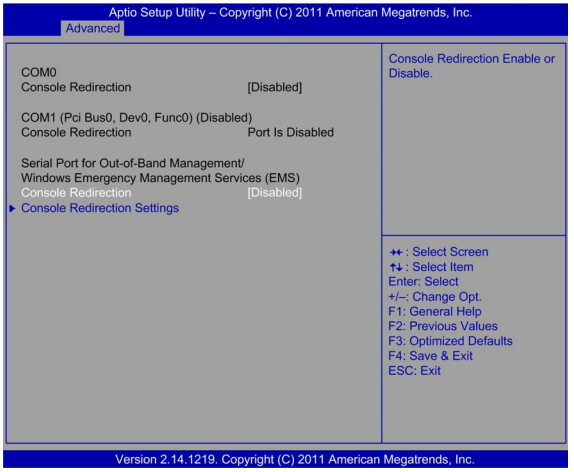


This table shows the **Serial Port 6 Configuration** options:

BIOS setting	Description
Serial Port	Enables or disables the serial port 6.
Change Settings	Selection of the optional settings for the serial port 6.

Serial Port Console Redirection Submenu

The **Serial Port Console Redirection** submenu:

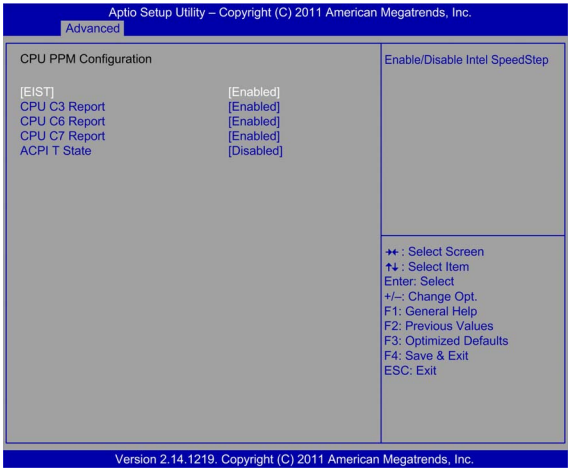


This table shows the **Serial Port Console Redirection** option:

BIOS setting	Description
Console Redirection	Enables or disables the console redirection feature.

CPU PPM Configuration Submenu

The **CPU PPM Configuration** submenu:



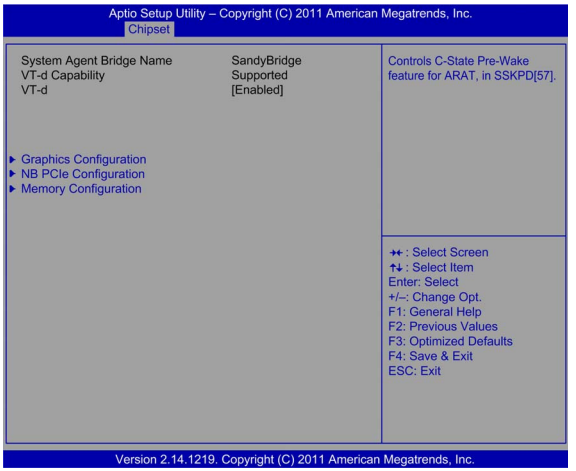
This table shows the **CPU PPM Configuration** options:

BIOS setting	Description
EIST	Enables or disables the Intel CPU SpeedStep.
Turbo Mode	Performance: [Enabled]

Chipset Menu

System Agent (SA) Configuration Submenu

The **System Agent** submenu:

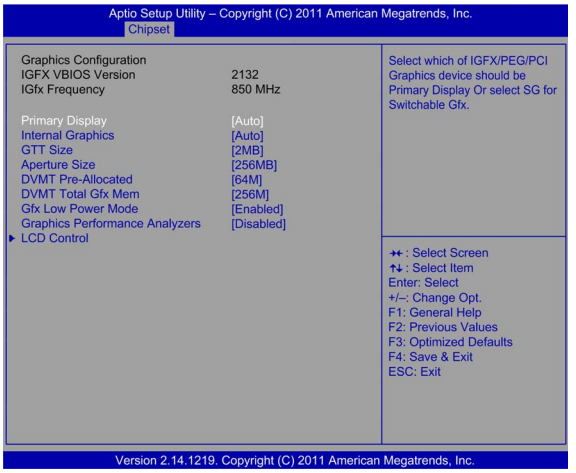


Additional **System Agent** options are

- Graphics Configuration *(see page 91)*
- NB PCIe Configuration *(see page 93)*

Graphics Configuration Submenu

The **Graphics Configuration** submenu

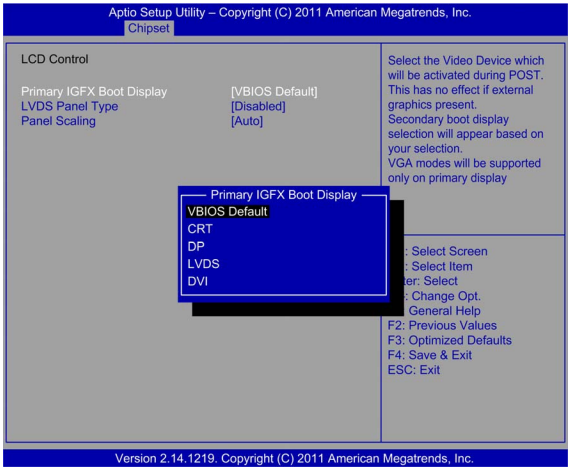


This table shows 2 **Graphics Configuration** options:

BIOS setting	Description
Primary Display [Auto]	Sets the video device that is activated during POST.
LCD Control	Sets LCD video device parameters.

LCD Control Submenu of the Graphics Configuration Menu

The **LCD Control** submenu

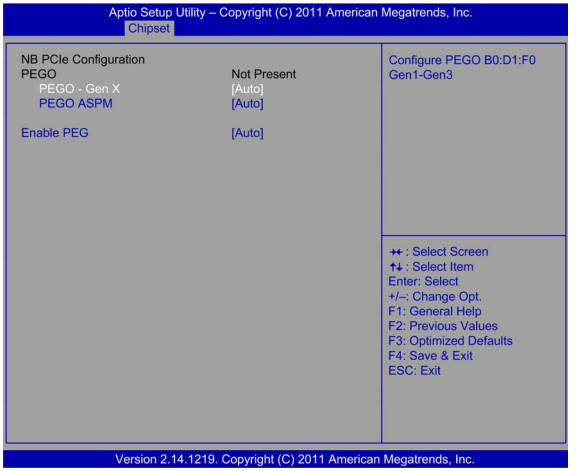


This table shows the **LCD Control** option:

BIOS setting	Description
Primary IGFX Boot Display [VBIOS Default]	Sets the video device that is activated during POST.

NB PCIe Configuration Submenu

The **NB PCIe Configuration** submenu



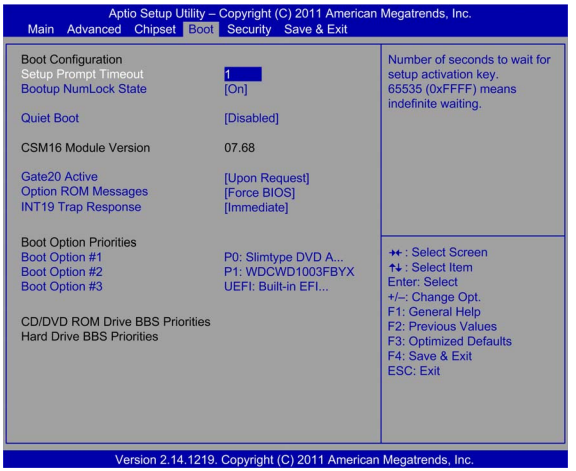
This table shows the **NB PCIe Configuration** option:

BIOS setting	Description
De-emphasis Control	Performance: -3.5 dB.

Boot Menu

Boot Tab

The **Boot** tab screen:



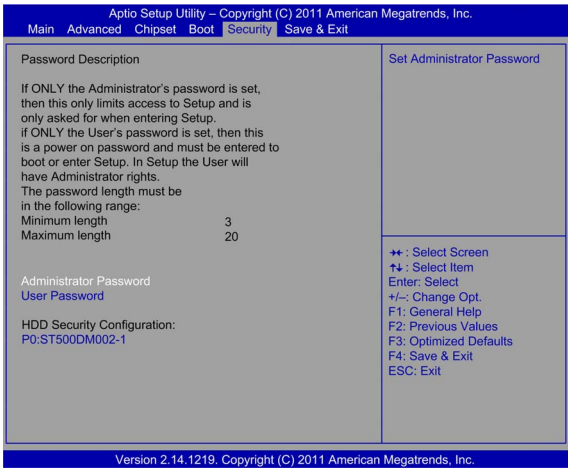
This table shows the **Boot** menu options:

BIOS setting	Description
Setup Prompt Timeout	Selects the number of seconds to wait for the setup activation key.
Bootup NumLock State	Selects the Numlock at power-on.
Quiet Boot	If disabled, the BIOS displays the normal POST messages. If enabled, an OEM Logo is shown instead of the POST messages.
Option ROM Message	Sets the display mode for an optional ROM.
Interrupt 19 Capture	Allows optional ROMs to trap interrupt 19.
Boot Option Priorities	Sets boot device priority. Optimized: • **Boot Option # 2 P1: Slimtype DVD A...** • **Boot Option # 1 P0: ST500DM002-1BD** Universal: • **Boot Option # 2 P5: Slimtype DVD A...** • **Boot Option # 1 P0: WDC WD50003ABYX...** Performance: • **Boot Option # 1 P5: Slimtype DVD A...** • **Boot Option # 2 P1: WDC WD1003FBYX-01Y7B1** • **Boot Option # 3 UEFI: Built-in EFI...**

Security Menu

Security Tab

The **Security** tab screen:



This table shows the **Security** menu options:

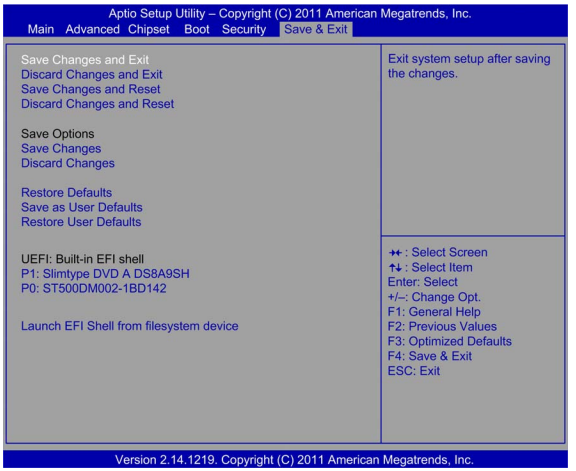
BIOS setting	Description
Change Administrator Password	Enter/change the administrator password. An administrator password is necessary to edit all BIOS settings.
Change User Password	Enter/change a user password. A user password allows the user to edit only certain BIOS settings.
HDD Security Configuration	Optimized: • **P0: ST500DM002-1** Universal: • **P0: WDC WD5003AB** Performance: • **P3: WDC WD1003FB**

NOTE: To access a password, select the password and press **ENTER**.

Save & Exit Menu

Save & Exit Tab

The **Save & Exit** tab screen:



The table shows the **Save & Exit** menu options:

BIOS setting	Description
Save Changes and Exit	When the system configuration is complete, select this option to save changes, exit BIOS setup, and, if necessary, reboot the computer to take into account all system configuration parameters.
Discard Changes and Exit	Select this option to quit setup without making any permanent changes to the system configuration.
Save Changes and Reset	Selecting this option displays a confirmation message box. On confirming, you save changes to the BIOS settings, save the settings to CMOS, and restart the system.
Discard Changes and Reset	Select this option to quit BIOS setup without making any permanent changes to the system configuration and reboot the computer.
Save Changes	Select this option to save the system configuration changes without exiting the BIOS setup menu.
Discard Changes	Select this option to discard any current changes and load previous system configuration.
Restore Defaults	Select this option automatically to configure all BIOS setup items to the optimal default settings. The optimal defaults are designed for maximum system performance, but may not work for all computer applications. Do not use the optimal defaults if the computer of the users is experiencing system configuration issues.

BIOS setting	Description
Save User Defaults	When the system configuration is complete, select this option to save changes as the user defaults without exit BIOS setup menu.
Restore User Defaults	Select this option to restore the user defaults.
Boot Override	Selects a device to use for a boot override. Optimized: ● **P1: Slimtype DVD A DS8A9SH** ● **P0: ST500DM002-1BD142** Universal: ● **P5: Slimtype DVD A DS8A9SH** ● **P1: WDC WD5003ABYX-01WERA1** Performance: ● **P1: Slimtype DVD A DS8A9SH** ● **UEFI: Built-in EFI shell** ● **WDC WD1003FBYX-01Y7B1**

Chapter 8
Hardware Modifications

Subject of This Chapter

This chapter is about the hardware modifications for the Harmony Rack iPC.

You can use optional units, main memory, CF cards manufactured by Schneider Electric, commercial devices with this product.

What Is in This Chapter?

This chapter contains the following topics:

Before Modifications

Overview

For detailed installation procedures for optional units, refer to the OEM (Original equipment manufacturer) Installation guide included with the optional unit.

⚠ ⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

- Remove all power from the device before removing any covers or elements of the system, and prior to installing or removing any accessories, hardware, or cables.
- Unplug the power cable from both the Harmony Industrial PC and the power supply.
- Always use a properly rated voltage sensing device to confirm that power is off.
- Replace and secure all covers or elements of the system before applying power to the unit.
- Use only the specified voltage when operating the Harmony Industrial PC. The AC unit is designed to use 100...240 Vac input.

Failure to follow these instructions will result in death or serious injury.

⚠ CAUTION

OVERTORQUE AND LOOSE HARDWARE

- Do not exert more than 0.5 Nm (4.5 lb-in) of torque when tightening the installation fastener, enclosure, accessory, or terminal block screws. Tightening the screws with excessive force can damage the installation fastener.
- When fastening or removing screws, ensure that they do not fall inside the Harmony Industrial PC chassis.

Failure to follow these instructions can result in injury or equipment damage.

⚠ CAUTION

STATIC SENSITIVE COMPONENTS

Harmony Industrial PC internal components, including accessories such as RAM modules and expansion boards, can be damaged by static electricity.

- Keep static-producing materials (plastic, upholstery, carpeting) out of the immediate work area.
- Do not remove ESD-sensitive components from their anti-static bags until you are ready to install them.
- When handling static-sensitive components, wear a properly grounded wrist strap (or equivalent).
- Avoid unnecessary contact with exposed conductors and component leads with skin or clothing.

Failure to follow these instructions can result in injury or equipment damage.

PCIe or PCI Card Installation

Overview

Before installing or removing a PCIe or PCI card, shut down Windows® in an orderly fashion and remove all power from the device.

⚠ ⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

- Remove all power from the device before removing any covers or elements of the system, and prior to installing or removing any accessories, hardware, or cables.
- Unplug the power cable from both the Harmony Industrial PC and the power supply.
- Always use a properly rated voltage sensing device to confirm that power is off.
- Replace and secure all covers or elements of the system before applying power to the unit.
- Use only the specified voltage when operating the Harmony Industrial PC. The AC unit is designed to use 100...240 Vac input.

Failure to follow these instructions will result in death or serious injury.

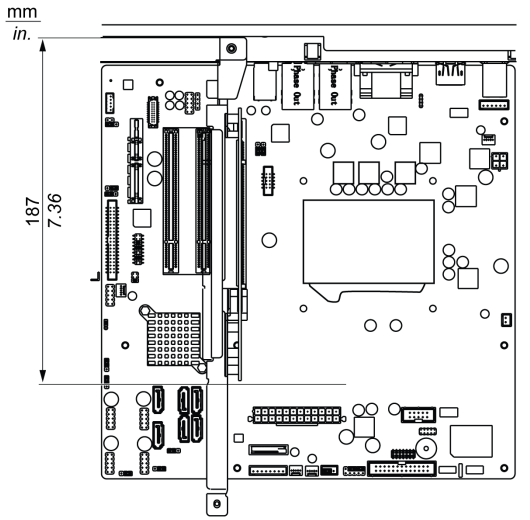
PCI Card Dimensions

NOTE: PCI cards cannot exceed the following dimensions.

PCI full length and standard height for the Rack iPC Universal and Optimized:

- Length: 187 mm (7.36 in.)
- Height: 106.7 mm (4.2 in.)

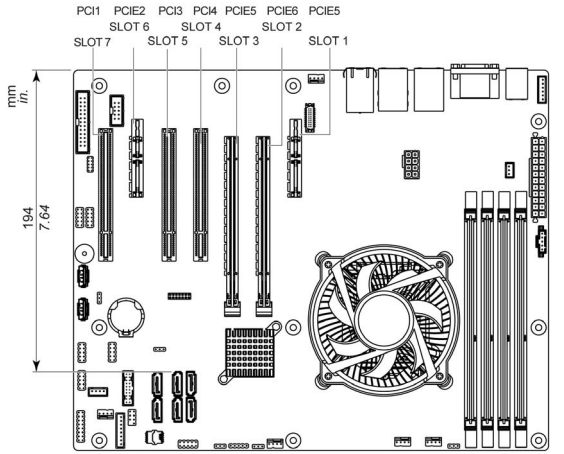
PCI card maximum length:



PCI full length and standard height for the Rack iPC Performance:

- Length: 194 mm (7.63 in.)
- Height: 106.7 mm (4.2 in.)

PCI card maximum length:



PCIe Card Dimensions

NOTE: PCIe cards cannot exceed the following dimensions.

PCI full length and standard height:

- Length: 174 mm (6.85 in.)
- Height: 106.7 mm (4.2 in.)

PCIe or PCI Card Installation

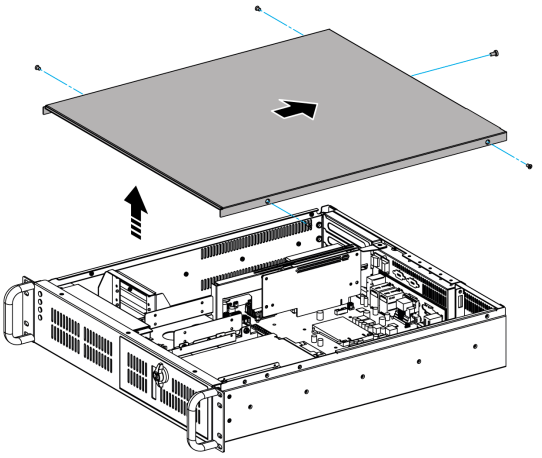
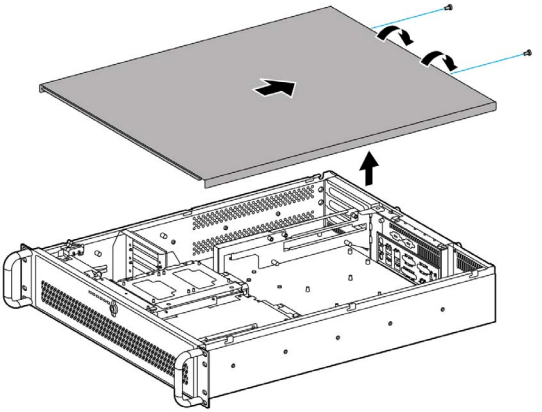
NOTICE
ELECTROSTATIC DISCHARGE Take the necessary protective measures against electrostatic discharge before attempting to remove the Harmony Industrial PC cover. **Failure to follow these instructions can result in equipment damage.**

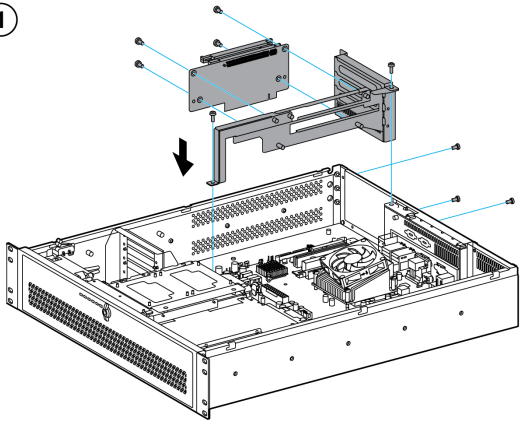
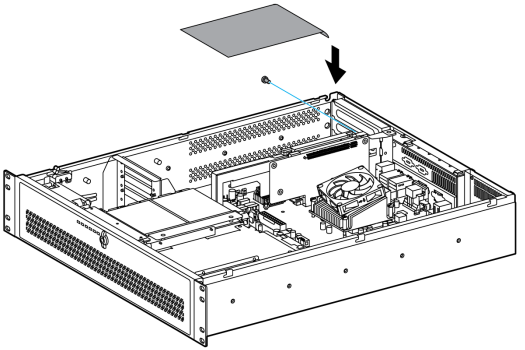
NOTE:

- Remove all power before attempting this procedure.
- It is recommended that you install the software driver before you install the hardware in your system.

The table describes the procedure to install a PCIe or PCI card:

Step	Action
1	Disconnect the power cord to the Rack iPC.
2	Touch the housing or ground connection (not the power supply) to discharge any electrostatic charge from your body.
3	Loosen 2 screws on the rear of the top cover for the Rack iPC Performance and Universal. Loosen 5 screws on the rear and both sides of the top cover for the Rack iPC Optimized.

Step	Action
4	Slide the top cover backwards and then lift it up Rack iPC Optimized:  Slide the top cover backwards and then lift it up for the Rack iPC Performance and Universal: 

Step	Action
5	Insert the PCIe or PCI board into the expansion board connector and in place using the filler panel screw. Install and plug the PCIe or PCI card on your PCIe or PCI Bus. Installing a riser card and an add-on card for the Rack iPC Universal and Optimized]: 1  2  **1** Installing a riser card **2** Installing add-on cards
6	Reinstall the top cover and tight the screws.
7	Connect the power cord to the Rack iPC.
8	Turn the Rack iPC power-on.
9	The driver installs the PCIe or PCI communication card automatically.
10	Refer to the pin assignment and wiring for further information.

⚠ CAUTION

OVERTORQUE AND LOOSE HARDWARE

- Do not exert more than 0.5 Nm (4.5 lb-in) of torque when tightening the installation fastener, enclosure, accessory, or terminal block screws. Tightening the screws with excessive force can damage the installation fastener.
- When fastening or removing screws, ensure that they do not fall inside the Harmony Industrial PC chassis.

Failure to follow these instructions can result in injury or equipment damage.

Front Storage Drive Trays, Description, and Installation

Drive Installation

⚠ ⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

- Remove all power from the device before removing any covers or elements of the system, and prior to installing or removing any accessories, hardware, or cables.
- Unplug the power cable from both the Harmony Industrial PC and the power supply.
- Always use a properly rated voltage sensing device to confirm that power is off.
- Replace and secure all covers or elements of the system before applying power to the unit.
- Use only the specified voltage when operating the Harmony Industrial PC. The AC unit is designed to use 100...240 Vac input.

Failure to follow these instructions will result in death or serious injury.

NOTICE

ELECTROSTATIC DISCHARGE

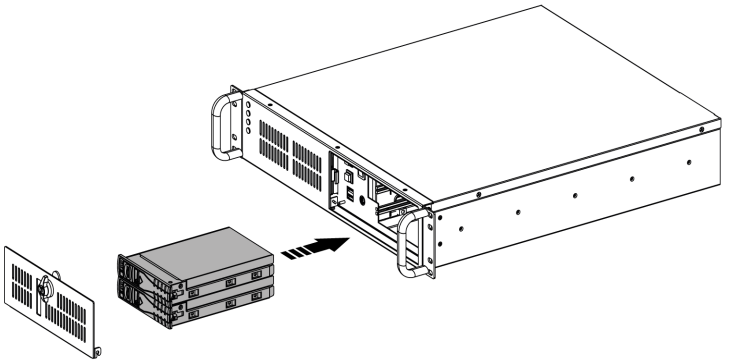
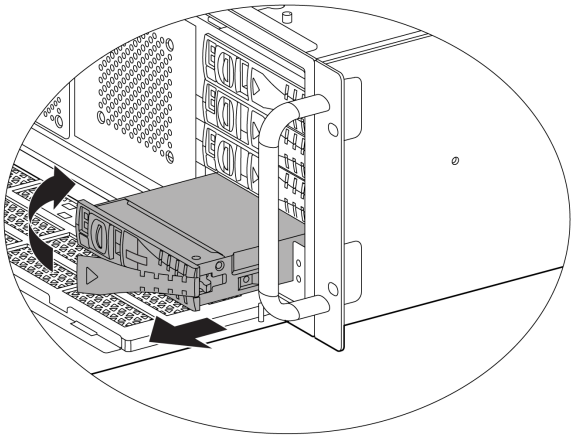
Take the necessary protective measures against electrostatic discharge before attempting to remove the Harmony Industrial PC cover.

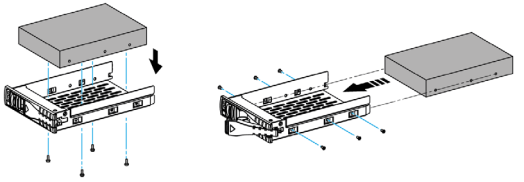
Failure to follow these instructions can result in equipment damage.

NOTE: Remove all power before attempting this procedure.

The table describes how to install an external drive tray of the Rack iPC:

Step	Action
1	Disconnect the power cord to the Rack iPC.
2	Touch the housing or ground connection (not the power supply) to discharge any electrostatic charge from your body.
3	Open the front door.

Step	Action
4	If you want to install a SATA HDD into the lower mobile tray, remove the front door first for the Rack iPC Optimized. The small door is attached to the rack with hinges without screws. Left-shift the key latch of one HDD tray to unlock the tray. Hold the handle of the tray and draw it out from the chassis:  Pushing up the latch and removing the mobile tray for the Rack iPC: 

Step	Action
5	Slide one SATA disk drive into the proper location in the tray and fix it with 4...6 screws. Installing a 2.5” or 3.5” SAS/SATA HDD: 
6	Return and push the HDD tray to the chassis until the handle of tray is moving back. Right-shift the key latch of the HDD tray to lock the tray.
7	Repeat steps 3 to 6 if there is a second SATA HDD to install.

⚠ CAUTION

OVERTORQUE AND LOOSE HARDWARE

- Do not exert more than 0.5 Nm (4.5 lb-in) of torque when tightening the installation fastener, enclosure, accessory, or terminal block screws. Tightening the screws with excessive force can damage the installation fastener.
- When fastening or removing screws, ensure that they do not fall inside the Harmony Industrial PC chassis.

Failure to follow these instructions can result in injury or equipment damage.

Internal Storage Drive, Description, and Installation

Drive Installation

⚠ ⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

- Remove all power from the device before removing any covers or elements of the system, and prior to installing or removing any accessories, hardware, or cables.
- Unplug the power cable from both the Harmony Industrial PC and the power supply.
- Always use a properly rated voltage sensing device to confirm that power is off.
- Replace and secure all covers or elements of the system before applying power to the unit.
- Use only the specified voltage when operating the Harmony Industrial PC. The AC unit is designed to use 100...240 Vac input.

Failure to follow these instructions will result in death or serious injury.

NOTICE

ELECTROSTATIC DISCHARGE

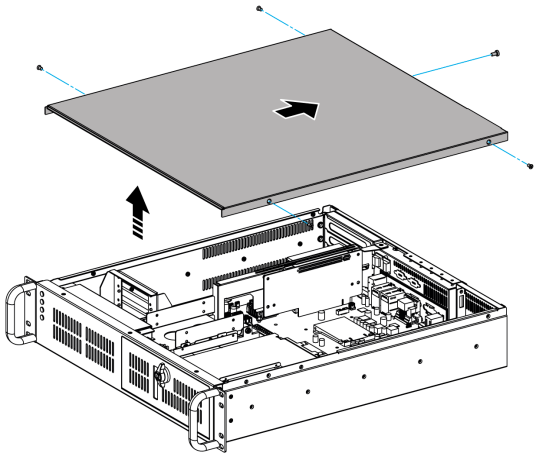
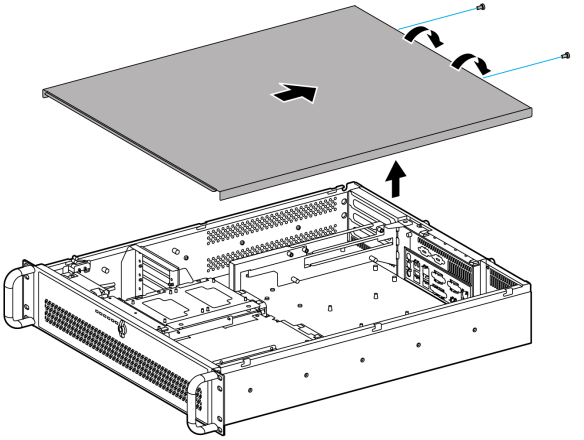
Take the necessary protective measures against electrostatic discharge before attempting to remove the Harmony Industrial PC cover.

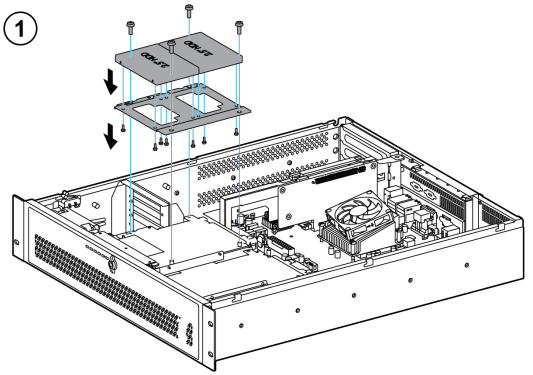
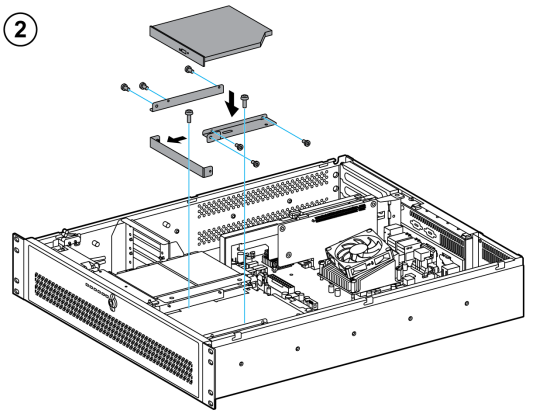
Failure to follow these instructions can result in equipment damage.

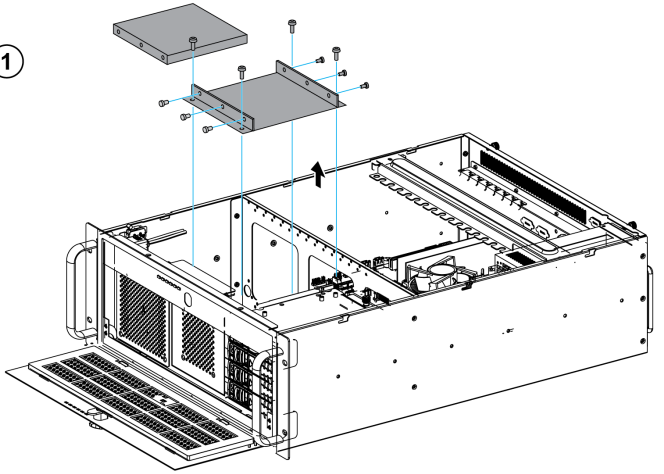
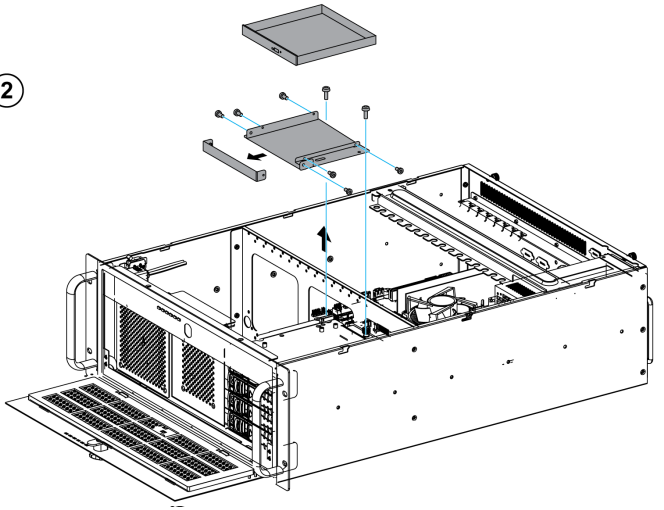
NOTE: Remove all power before attempting this procedure.

The table describes how to install an internal storage drive of the Rack iPC:

Step	Action
1	Disconnect the power cord to the Rack iPC.
2	Touch the housing or ground connection (not the power supply) to discharge any electrostatic charge from your body.
3	Loosen 2 screws on the rear of the top cover for the Rack iPC Performance and Universal. Loosen 5 screws on the rear and both sides of the top cover for the Rack iPC Optimized.

Step	Action
4	Slide the top cover backwards and then lift it up Rack iPC Optimized:  Slide the top cover backwards and then lift it up for the Rack iPC Performance and Universal: 

Step	Action
5	Add an adapter to install the drive and fix it with the screws for the Rack iPC Optimized and Universal: 1  2  **1** Installing the internal storage drive **2** Installing the slim-type optical disk drive

Step	Action
6	Add an adapter to install the drive and fix it with the screws for the Rack iPC Performance: 1  2  **1** Installing the internal storage drive **2** Installing the slim-type optical disk drive
7	Reinstall the top cover and tighten the screws.

⚠ CAUTION

OVERTORQUE AND LOOSE HARDWARE

- Do not exert more than 0.5 Nm (4.5 lb-in) of torque when tightening the installation fastener, enclosure, accessory, or terminal block screws. Tightening the screws with excessive force can damage the installation fastener.
- When fastening or removing screws, ensure that they do not fall inside the Harmony Industrial PC chassis.

Failure to follow these instructions can result in injury or equipment damage.

Memory Card Description and Installation

Overview

The Rack iPC has four 240-pin memory sockets for DDR3 ECC/Non-ECC 1066/1333/1600 MHz memory cards with maximum capacity of 32 GB (maximum 8 GB for each DIMM).

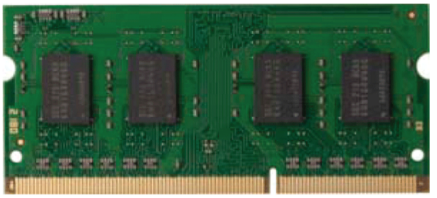
The Rack iPC supports a CPU with a built-in full speed L3 cache: The built-in third-level cache in the processor yields much higher performance than conventional external cache memories.

The Rack iPC Universal supports a CPU with the following built-in full speed L3 cache:
- 3 Mb for Intel Core i3-2120
- 3 Mb for Intel Pentium G850

The Rack iPC Optimized supports a CPU with the following built-in full speed L3 cache:
- 2 Mb for Intel Celeron G540

The Rack iPC supports only non-ECC DDR3 memory modules and does not support registered dual in-line memory module (RDIMM).

This figure shows a memory card:



Main Memory Card Description

This table provides the technical data of the memory card:

Features	Values			
Part number	**HMIYPRAM3040R1**	**HMIYPRAM3080R1**	**HMIYPRAME040R1**	**HMIYPRAME080R1**
Type	DIMM DDR3 SDRAM	DIMM DDR3 SDRAM	DIMM ECC	DIMM ECC
Memory size	4 GB	8 GB	4 GB Rack PC with OS server	8 GB Rack PC with OS server
Construction	240-pin			
Speed	667 MHz for 1333 Mb/s/Pin			

Memory Card Exchange

Before installing or removing a memory card, shut down Windows® in an orderly fashion and remove all power from the device.

⚠ ⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

- Remove all power from the device before removing any covers or elements of the system, and prior to installing or removing any accessories, hardware, or cables.
- Unplug the power cable from both the Harmony Industrial PC and the power supply.
- Always use a properly rated voltage sensing device to confirm that power is off.
- Replace and secure all covers or elements of the system before applying power to the unit.
- Use only the specified voltage when operating the Harmony Industrial PC. The AC unit is designed to use 100...240 Vac input.

Failure to follow these instructions will result in death or serious injury.

NOTICE

ELECTROSTATIC DISCHARGE

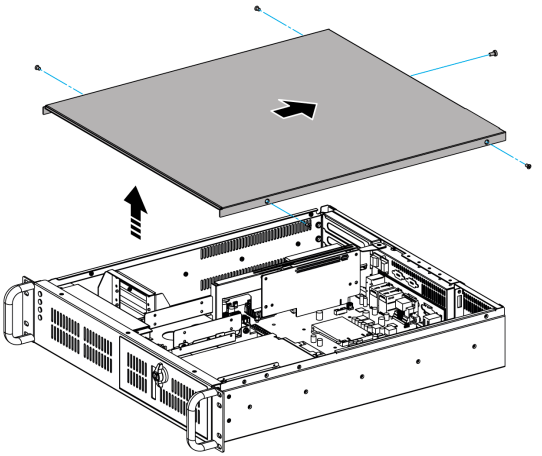
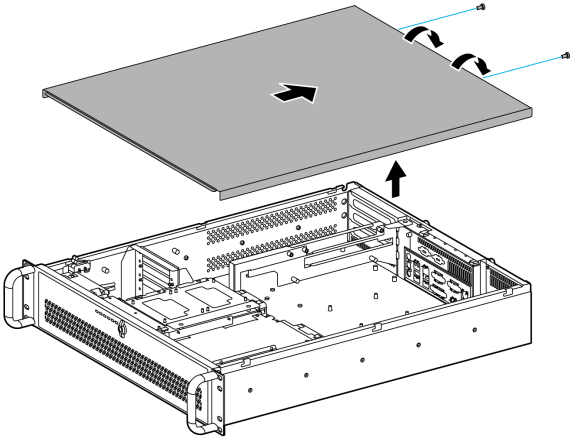
Take the necessary protective measures against electrostatic discharge before attempting to remove the Harmony Industrial PC cover.

Failure to follow these instructions can result in equipment damage.

NOTE: Remove all power before attempting this procedure.

The table describes the procedure to exchange a memory card of the Rack iPC:

Step	Action
1	Disconnect the power cord to the Rack iPC.
2	Touch the housing or ground connection (not the power supply) to discharge any electrostatic charge from your body.
3	Loosen two screws on the rear of the top cover for the Rack iPC Performance and Universal. Loosen five screws on the rear and both sides of the top cover for theRack iPC Optimized.

Step	Action
4	Slide the top cover backwards and then lift it up Rack iPC Optimized:  Slide the top cover backwards and then lift it up for the Rack iPC Performance and Universal: 
5	You can now exchange the memory card. To do so, carefully press the fastening clamps outward and pull out the installed memory card.

Step	Action
6	First make sure that the two handles of the DIMM socket are in the **open** position, for example, the handles lean outward. Slowly slide the DIMM module along the plastic guides on both ends of the socket. Then firmly but gently (avoid pushing down too hard) press the DIMM module down into the socket until you hear a click. When the two handles lock the memory module into the correct position of the DIMM socket.
7	Reinstall the top cover and tighten the screws.

⚠ CAUTION

OVERTORQUE AND LOOSE HARDWARE

- Do not exert more than 0.5 Nm (4.5 lb-in) of torque when tightening the installation fastener, enclosure, accessory, or terminal block screws. Tightening the screws with excessive force can damage the installation fastener.
- When fastening or removing screws, ensure that they do not fall inside the Harmony Industrial PC chassis.

Failure to follow these instructions can result in injury or equipment damage.

Universal and Optimized Rack iPC Serial Line Description and Installation

Serial Line Exchange

Before installing a serial line interface, shut down Windows® in an orderly fashion and remove all power from the device.

⚠⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

- Remove all power from the device before removing any covers or elements of the system, and prior to installing or removing any accessories, hardware, or cables.
- Unplug the power cable from both the Harmony Industrial PC and the power supply.
- Always use a properly rated voltage sensing device to confirm that power is off.
- Replace and secure all covers or elements of the system before applying power to the unit.
- Use only the specified voltage when operating the Harmony Industrial PC. The AC unit is designed to use 100...240 Vac input.

Failure to follow these instructions will result in death or serious injury.

⚠ WARNING

EQUIPMENT DISCONNECTION OR UNINTENDED EQUIPMENT OPERATION

- Ensure that power, communication, and accessory connections do not place excessive stress on the ports. Consider the vibration in the environment.
- Securely attach power, communication, and external accessory cables to the panel or cabinet.
- Use only D-Sub 9-pin connector cables with a locking system in good condition.
- Use only commercially available USB cables.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

NOTICE

ELECTROSTATIC DISCHARGE

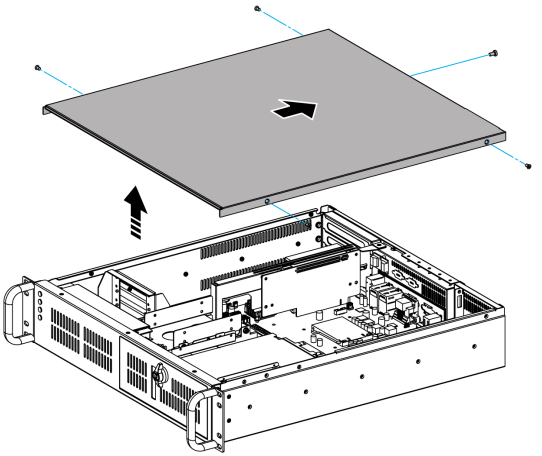
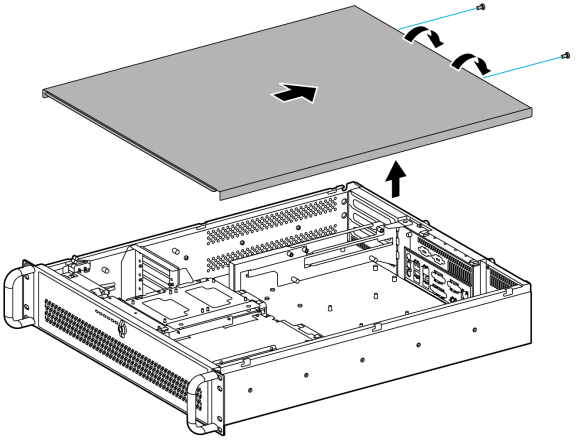
Take the necessary protective measures against electrostatic discharge before attempting to remove the Harmony Industrial PC cover.

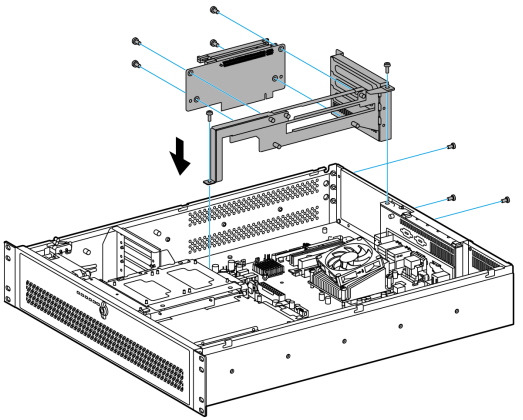
Failure to follow these instructions can result in equipment damage.

NOTE: Be sure to remove all power before attempting this procedure.

The table describes the procedure to exchange a serial line interface of the Rack iPC:

Step	Action
1	Disconnect the power cord to the Rack iPC.
2	Touch the housing or ground connection (not the power supply) to discharge any electrostatic charge from your body.
3	Loosen two screws on the rear of the top cover for the Rack iPC Universal. Loosen five screws on the rear and both sides of the top cover for the Rack iPC Optimized.

Step	Action
4	Slide the top cover backwards and then lift it up Rack iPC Optimized:  Slide the top cover backwards and then lift it up for the Rack iPC Performance and Universal: 
5	Verify that the kit is complete: ● 2 PCI brackets and screws ● 2 Sub-D9 connectors on each bracket. The 4 Sub-D9 connectors are connected by four ribbons that merge in to a single wide ribbon with a female connector.

Step	Action
6	Remove the metal covers from 2 PCI slots: 
7	Install the PCI brackets in the uncovered slots.
8	Connect the ribbon to the **COM345** socket on the motherboard.
9	Reinstall the top cover and tight the screws.

⚠ CAUTION

OVERTORQUE AND LOOSE HARDWARE

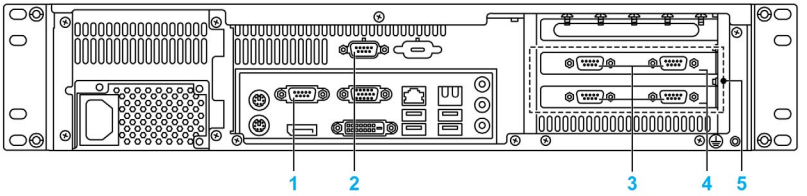
- Do not exert more than 0.5 Nm (4.5 lb-in) of torque when tightening the installation fastener, enclosure, accessory, or terminal block screws. Tightening the screws with excessive force can damage the installation fastener.
- When fastening or removing screws, ensure that they do not fall inside the Harmony Industrial PC chassis.

Failure to follow these instructions can result in injury or equipment damage.

The Universal and Optimized have 2 serial line connectors by default.

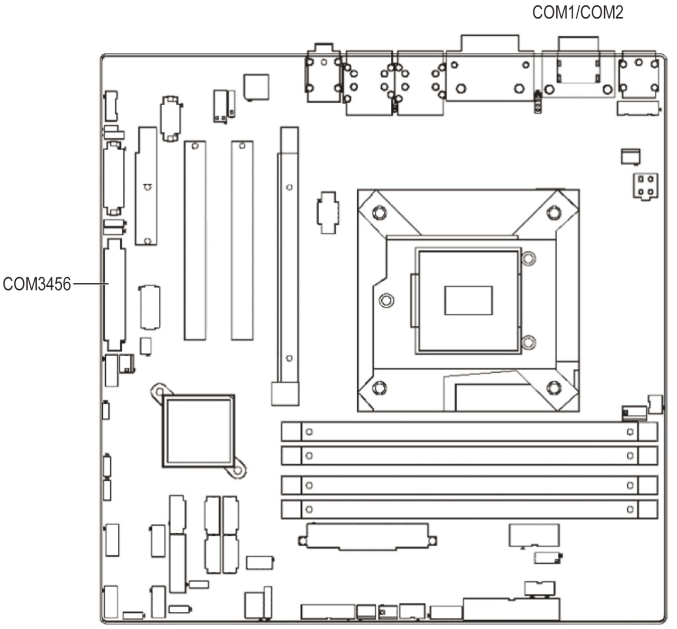
They also have an optional kit (HMIYRINSL21) to install 4 additional serial line connectors.

The Universal and Optimized serial line connectors are:



1 Default serial port on motherboard (COM1)
2 Default serial port connected by cable to the motherboard (COM2)
3 Sub-D9 connectors x 4
4 PCI brackets x 2
5 Optional serial line kit

The micro-ATX motherboard of Universal and Optimized showing the connection for the serial line optional kit:



Performance Rack iPC Serial Line Description and Installation

Serial Line Exchange

Before installing a serial line interface, shut down Windows® in an orderly fashion and remove all power from the device.

⚠⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

- Remove all power from the device before removing any covers or elements of the system, and prior to installing or removing any accessories, hardware, or cables.
- Unplug the power cable from both the Harmony Industrial PC and the power supply.
- Always use a properly rated voltage sensing device to confirm that power is off.
- Replace and secure all covers or elements of the system before applying power to the unit.
- Use only the specified voltage when operating the Harmony Industrial PC. The AC unit is designed to use 100...240 Vac input.

Failure to follow these instructions will result in death or serious injury.

⚠ WARNING

EQUIPMENT DISCONNECTION OR UNINTENDED EQUIPMENT OPERATION

- Ensure that power, communication, and accessory connections do not place excessive stress on the ports. Consider the vibration in the environment.
- Securely attach power, communication, and external accessory cables to the panel or cabinet.
- Use only D-Sub 9-pin connector cables with a locking system in good condition.
- Use only commercially available USB cables.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

NOTICE

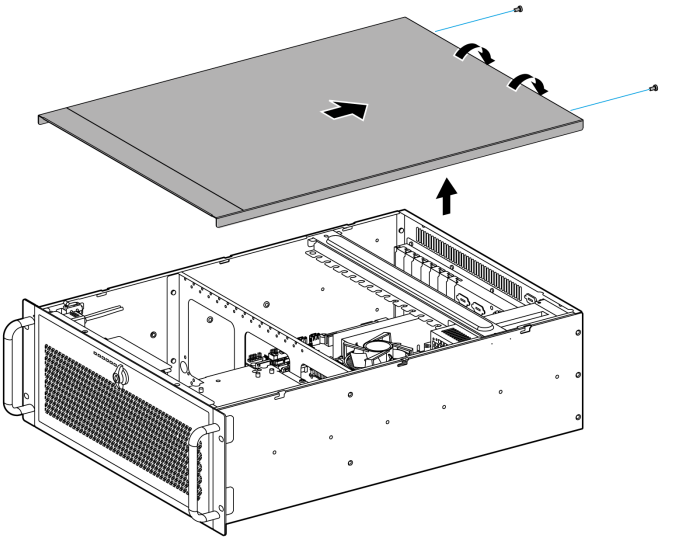
ELECTROSTATIC DISCHARGE

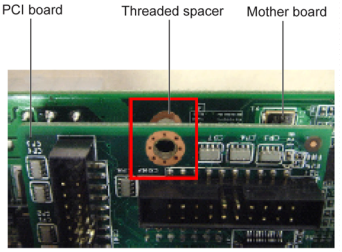
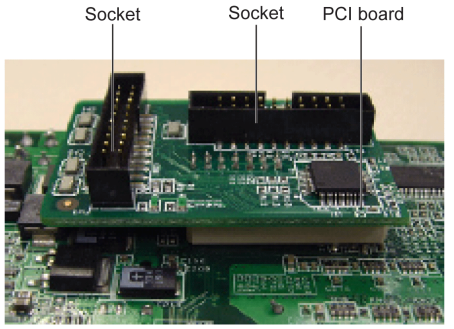
Take the necessary protective measures against electrostatic discharge before attempting to remove the Harmony Industrial PC cover.

Failure to follow these instructions can result in equipment damage.

NOTE: Be sure to remove all power before attempting this procedure.

The table describes the procedure to exchange a serial line interface of the Rack iPC:

Step	Action
1	Disconnect the power cord from the Rack iPC.
2	Touch the housing or ground connection (not the power supply) to discharge any electrostatic charge from your body.
3	Loosen two screws on the rear of the top cover.
4	Remove the top cover: 
5	Verify that the kit is complete: ● 1 x PCI board ● 4 x Sub-D9 connectors each with its ribbon and mounting hardware
6	Using a screwdriver, remove the metal cut-outs for the Sub-D9 connectors to make holes in the rear of the Rack iPC.
7	Install the Sub-D9 connectors in the four holes.
8	Connect the PCI board on the connector of the ATX motherboard.

Step	Action
9	Check the screw position of ATX motherboard and the PCI board, use threaded spacer and screw to fix: 
10	Connect a pair of Sub-D9 connector ribbons to the sockets on the PCI board: 
11	Reinstall the top cover and tighten the screws.

⚠ CAUTION

OVERTORQUE AND LOOSE HARDWARE

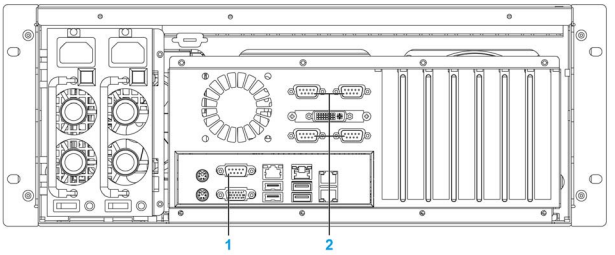
- Do not exert more than 0.5 Nm (4.5 lb-in) of torque when tightening the installation fastener, enclosure, accessory, or terminal block screws. Tightening the screws with excessive force can damage the installation fastener.
- When fastening or removing screws, ensure that they do not fall inside the Harmony Industrial PC chassis.

Failure to follow these instructions can result in injury or equipment damage.

The Performance Rack iPC has 1 serial line connector by default.

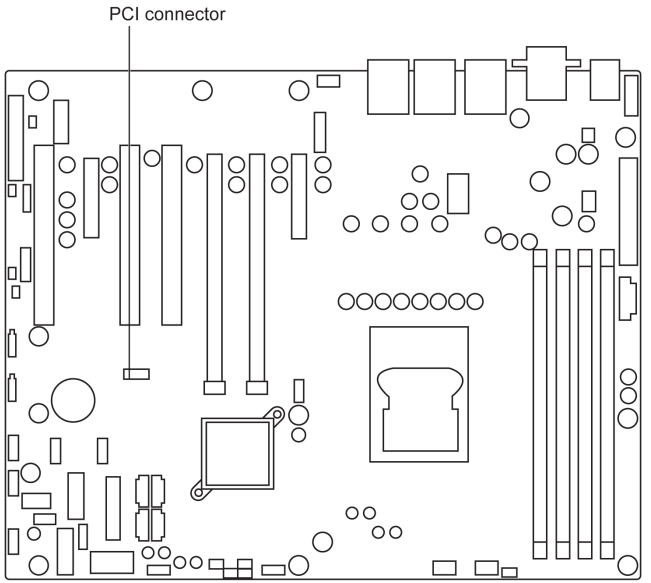
It has an optional kit (HMIYRINSL41) to install 4 additional serial line connectors.

The Performance Rack iPC serial line connectors:



1 Default serial port on motherboard (COM1)
2 Sub-D9 connectors (COM2, COM3, COM4, COM5) x 4

The ATX motherboard of the Performance Rack iPC showing PCI connector used for the serial line optional kit:



RAID Option

Introduction

Supported Intel chipset and operating system information is available at the Intel® rapid storage technology support webpage.

The information is to enable a user to set up properly and configure a system using Intel® rapid storage technology. It provides steps for setup and configuration, as well as a brief overview on Intel® rapid storage technology features.

Intel® rapid storage technology features is a code module built into the system BIOS that provides boot support for **RAID** volumes as well as a user interface for configuring and managing **RAID** volumes.

Redundant array of independent drives (**RAID**) allows data to be distributed across multiple hard drives to provide data redundancy or to enhance data storage performance.

The latest version of Intel® rapid storage technology can also be downloaded from download center at:

http://downloadcenter.intel.com/

For all settings about RAID tool on windows, refer to the user manual:

http://download.intel.com/support/chipsets/imsm/sb/irst_user_guide.pdf

NOTE: In order to create the **SATA RAID** volume and get into the **Configuration Utility**, **SATA** mode selection must be set to **RAID** in the **Advanced → SATA configuration** BIOS setting menu.

Smart Fan Configuration

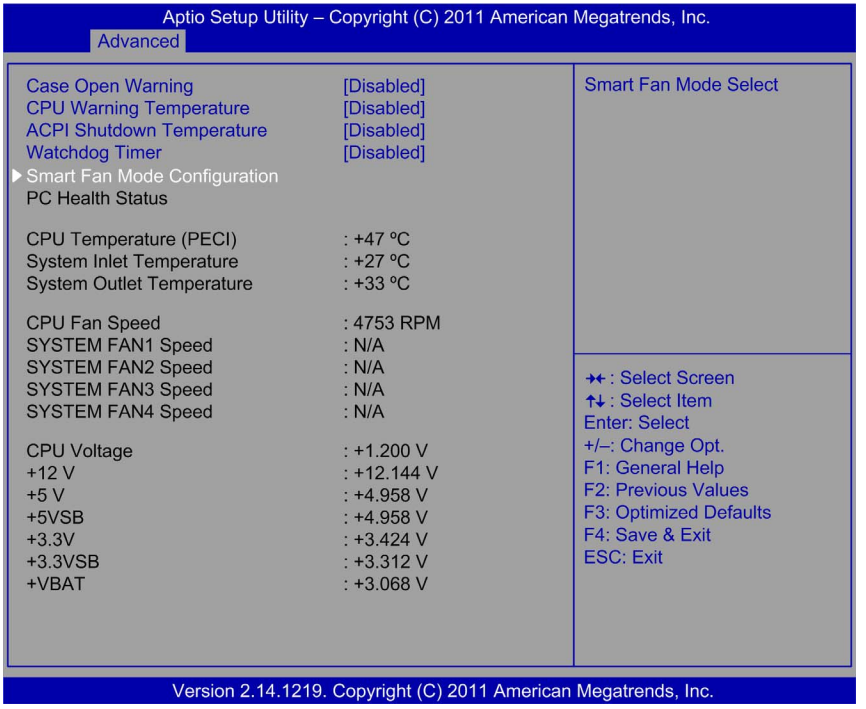
Introduction

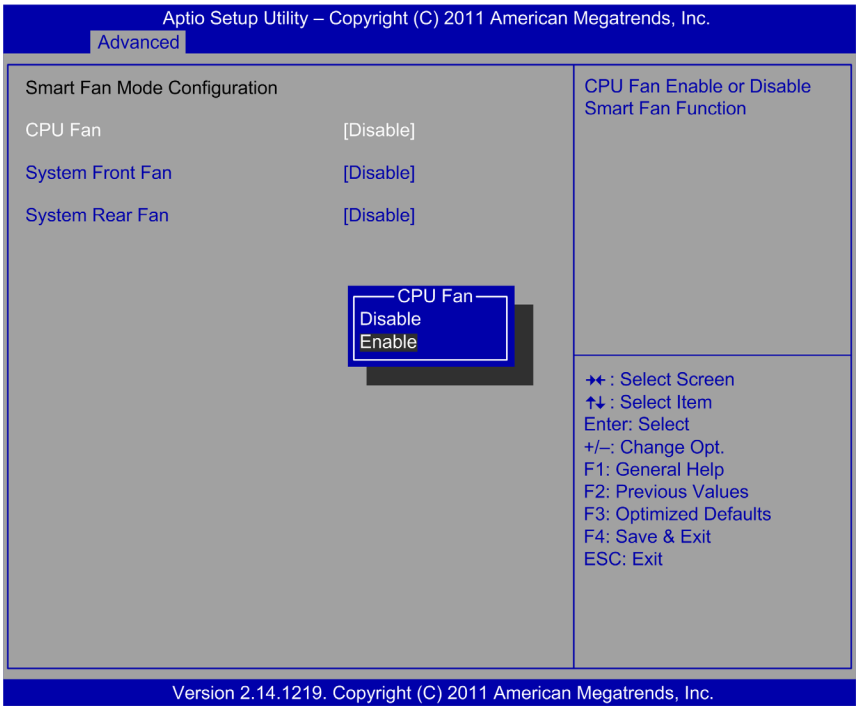
Smart Fan Control automatically adjusts the fan speed so that they run faster when the CPU is hotter to maintain the CPU at a constant temperature without running the fan constantly.

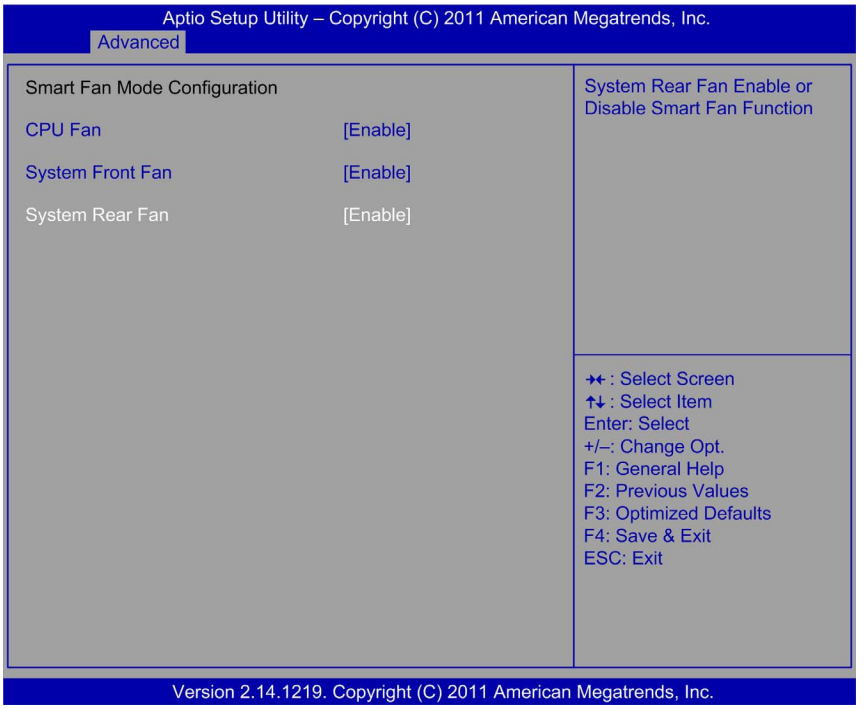
This normally involves setting a minimum and maximum fan speed, as well as a high and low CPU temperature. At the low temperature, the fans start running at the minimum fan speed. The fan speed varies in line with the CPU temperature until it reaches the high CPU temperature.

BIOS Configuration for the Rack iPC Performance

The table describes the procedure to configure the fan:

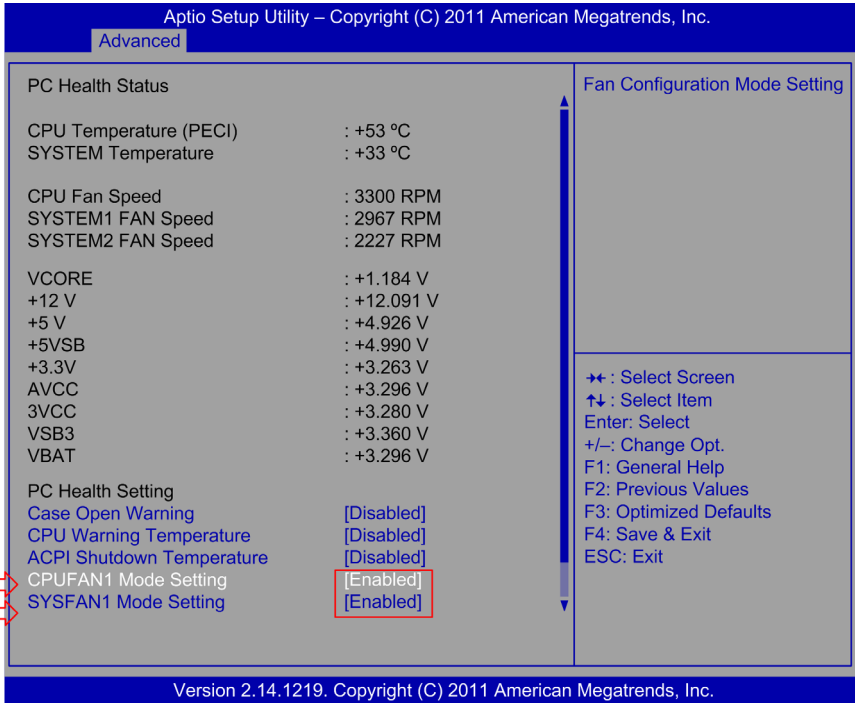
Step	Action
1	For enter BIOS setup, press **DEL** or **F2** key after the Rack iPC has been initialized. Use arrow keys to select among the items and press <Enter> to accept or enter the submenu. For creating the smart fan configuration use the BIOS **Advanced** menu: 

Step	Action
2	Move to the **Advanced** settings and scroll down to the **H/W Monitor**: Select **Smart Fan Mode Configuration** and press **Enter**:  You can access the following options from the BIOS setup: • **CPU Fan** • **System Front Fan** • **System Rear Fan**

Step	Action
3	Choose the fan and select **Enable**: 
4	Move to the **Advanced** settings and **Save and Exit**.

BIOS Configuration for the Rack iPC Universal and Optimized

The table describes the procedure to configure the fan:

Step	Action
1	For enter BIOS setup, press **DEL** or **F2** key after the Rack iPC has been initialized. Use arrow keys to select among the items and press <Enter> to accept or enter the submenu.
2	Move to the **Advanced** settings and scroll down to the **H/W Monitor**: 
3	Move down to: ● **CPUFAN1 Mode Setting** and change it to **Enabled**. ● **SYSFAN1 Mode Setting** and change it to **Enabled**
4	Move to the **Advanced** settings and **Save and Exit**.

Part III
Installation

Subject of this Part

This part describes the product installation.

What Is in This Part?

This part contains the following chapters:

Chapter 9
Connections to PLCs

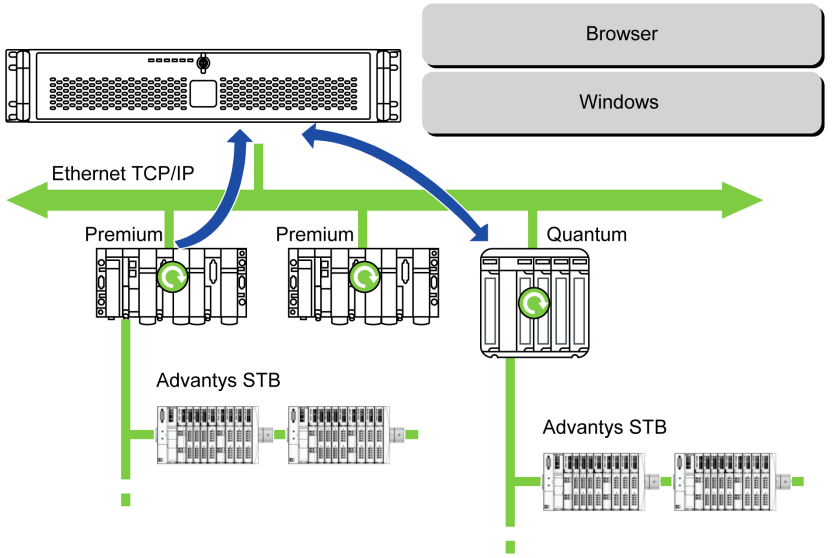
Connection to PLCs

Introduction

Two different kinds of architecture are possible when connecting the Rack iPC to PLCs:

- **Transparent Ready** architecture
- Traditional architecture

Transparent Ready Architecture

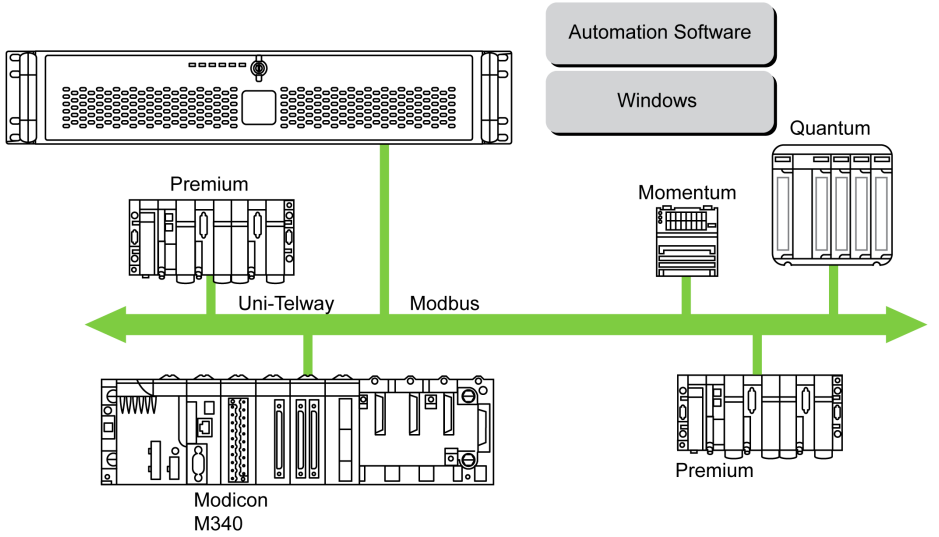


With its built-in Ethernet 10/100 Mbit/s ports, you can integrate the Rack iPC into *full Ethernet* architectures, such as **Transparent Ready**. **Transparent Ready** devices in this type of architecture enable transparent communication over the Ethernet TCP/IP network. Communication services and Web services permit the sharing and distribution of data between levels 1, 2 and 3 of the **Transparent Ready** architecture.

Used as a client station, the Rack iPC makes it easier to implement Web client solutions for:

- Basic servers embedded in field devices (**Advantys STB**/**Momentum** distributed I/O, ATV 71/38/58 starters, **OsiSense** identification systems, and so on).
- **FactoryCast** Web servers embedded in **Modicon PLCs** (**TSX Micro**, **Premium**, and **Quantum**) or the **FactoryCast** gateway. The following services are available as standard (without the need for additional programming): alarm management, comprehensive view management, and Web home pages created by users.
- **FactoryCast** HMI Web servers embedded in **Modicon Premium** and **Quantum PLCs** which also provide basic data management services, automatic e-mail sending triggered by specific process events and arithmetic and logic calculations for data preprocessing.

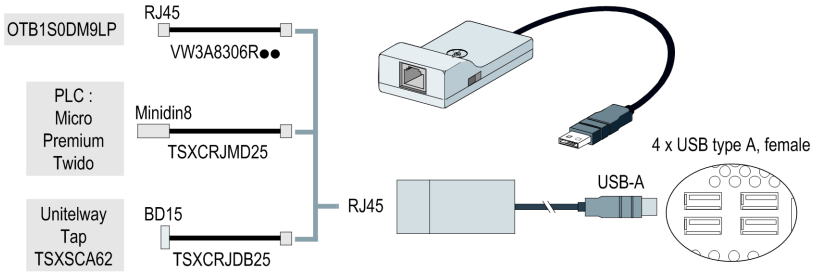
Traditional Architecture



The Rack iPC terminal with **Vijeo Designer** automation software can be used in fieldbus architectures such as **Uni-Telway**/**Modbus** or **Fipway**/**Modbus Plus**.

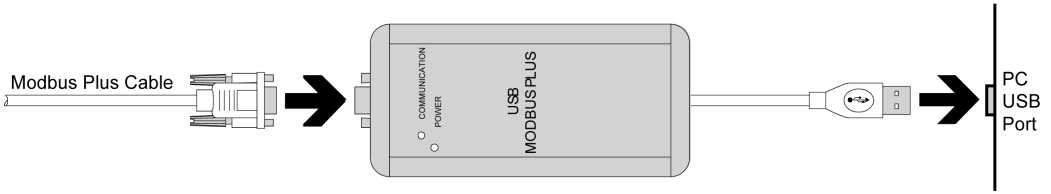
The Rack iPC terminal can connect to **Uni-Telway**, **Modbus**, and **Fipway** networks, but different connection devices are required depending on the network and on the communication port used. These devices are specified below:

- For USB slot:
  - **Modbus** and **Uni-Telway** with the TSXCUSB485 converter enables the Rack iPC to connect to remote devices using an RS-485 interface.
    The Rack iPC, compatible with **Modbus** and **Uni-Telway**, requires the standard Schneider-Electric drivers provided with software such as Unity Pro, PL7-Pro, or a driver on the CD called TLXCDDRV20M. An example is provided in the drawing below:



NOTE: The **Vijeo Designer Runtime** is not compatible with this device. **Vijeo Designer Runtime** communicates using an RS-232 interface.

  - **Modbus Plus** network with the TSXCUSBMBP converter. This converter is compatible with PCs equipped with **CONCEPT**, **ProWORX**, or **Unity Pro**. An example is provided in the drawing below:



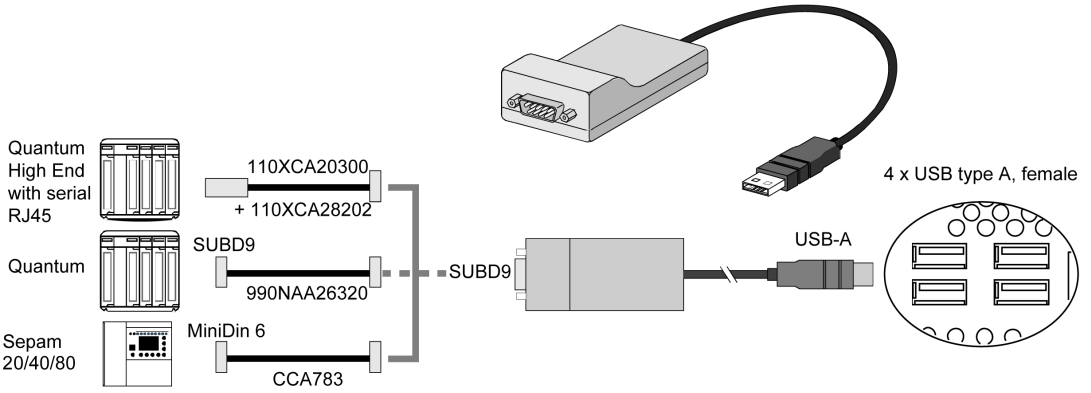
(1) Requires the *X-Way drivers* CD-ROM, TLXCDDRV20M.

Cables and Converters

For different types of PLCs, the following cables and converters are required:

- TSXPCX1031 connection cable for **Nano**, **Micro** and **Premium**.
  This cable is supplied with **Unity Pro**, **PL7-Pro** and **PL7 Junior** software.
- FT20CBCL30 connection cable for the Series 7 family (including TSX 27 PLCs, and TSX/PMX 47/67/87/107 PLCs).
  This cable is supplied with the XTEL pack software.
- TSX17ACCPC converter for TSX 17 PLCs.
- TSXCUSB232 converter for connecting the Rack iPC, via an USB port, to remote devices using a RS-232C interface.
  NOTE: This device, compatible with **Modbus** and **Uni-Telway**, requires the standard Schneider-Electric drivers provided with software such as **Unity Pro**, **PL7-Pro**, or a driver on the CD called TLXCDDRV20M.

An example using the TSXUSB232 converter is provided in the drawing below:



Chapter 10
System Monitor

Subject of this Chapter

This chapter describes the system monitor features of the Rack iPC.

What Is in This Chapter?

This chapter contains the following topics:

System Monitor Interface

Overview

The **System Monitor** interface provides a remote device monitoring, desktop connection, features that help you to access multiple clients through a single console for remote device management. The **System Monitor** immediately recognizes sudden equipment, provides real-time equipment maintenance, and an active update feature improves system stability and reliability.

The **Remote Monitoring** monitors system status of remote devices, including hard disk temperature, hard drive health, network connection, system / CPU temperatures, system / CPU fan speeds and system voltages. Support for email alarms and function logs so that managers can regularly keep track of their remote devices.

Depending on the configuration, if thresholds are exceeded, the **System Monitor** opens a popup message, sound a buzzer, and makes an entry in the Windows event log. You can configure a system shutdown when an alarm occurs.

System Monitor Requirements

Operating system requirements:

Operating system
Windows XP
Windows 7

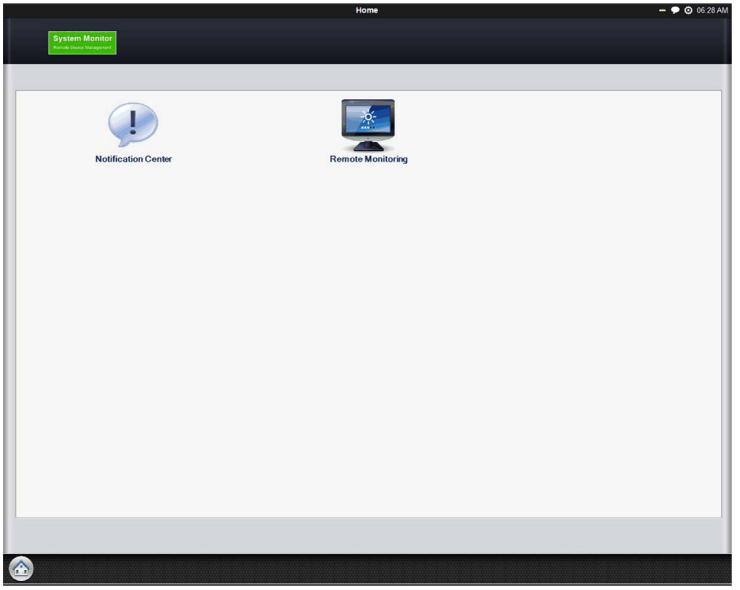
Software requirements:

Description	Software
Framework	Microsoft.NET Framework version 2.0 or higher
Driver	Software APP 2.0 API

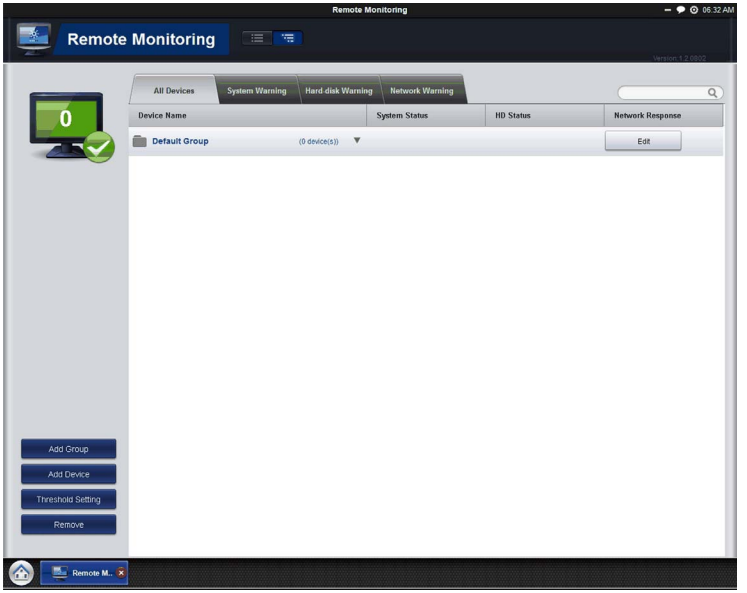
System Monitor Console

System Monitor console acts as a server for the clients. Devices that run on **System Monitor** console displays the health and status information from the **System Monitor** clients. The console has to be made available by client over a network.

To launch the **System Monitor** console, click **Windows Start Menu → All Programs → Schneider-Electric → System Monitor**

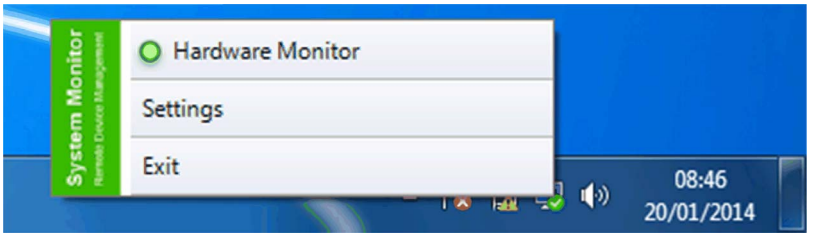


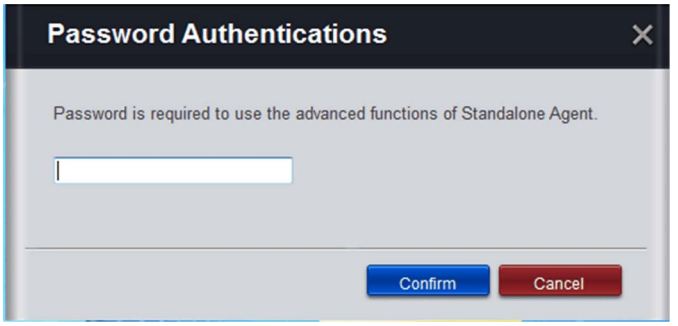
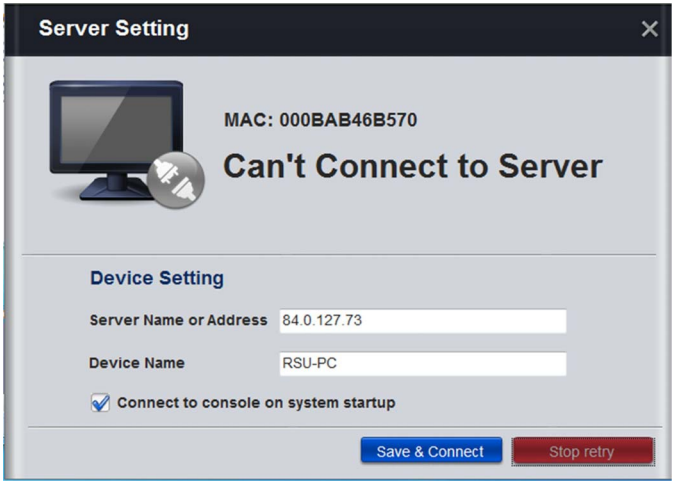
Click **Remote Monitoring** applications:

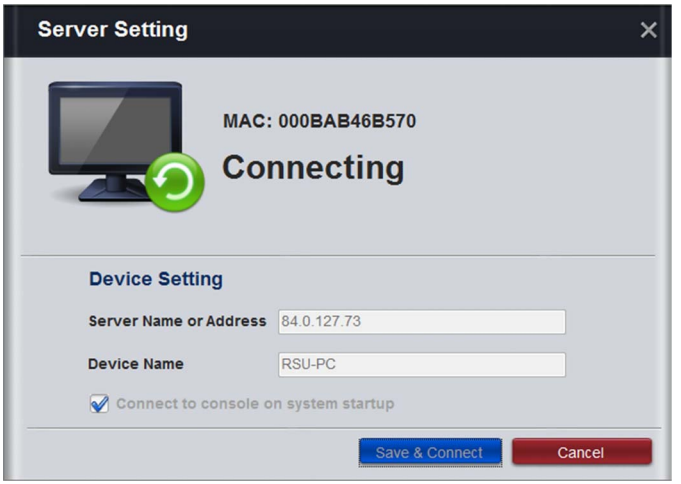
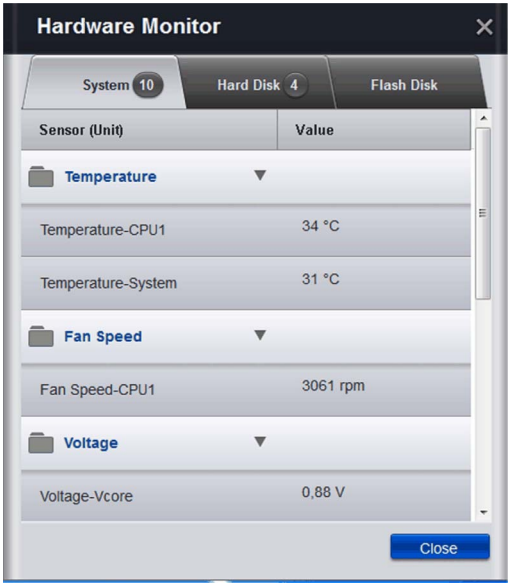


System Monitor Agent

This procedure describes the **System Monitor Stand Alone Agent** general user interface:

Stage	Description
1	The **System Monitor** stands alone agent automatically starts when the system starts. If you have to enter a new server IP address, you need to open the **System Monitor Agent**, click the icon in the toolbar: 

Stage	Description
2	You have to enter your **Password Authentications**: 
3	You have to enter your server IP address. Your server is the device which has **System Monitor** console running. Name the device gives the possibility to recognize it in multiple client configurations: 

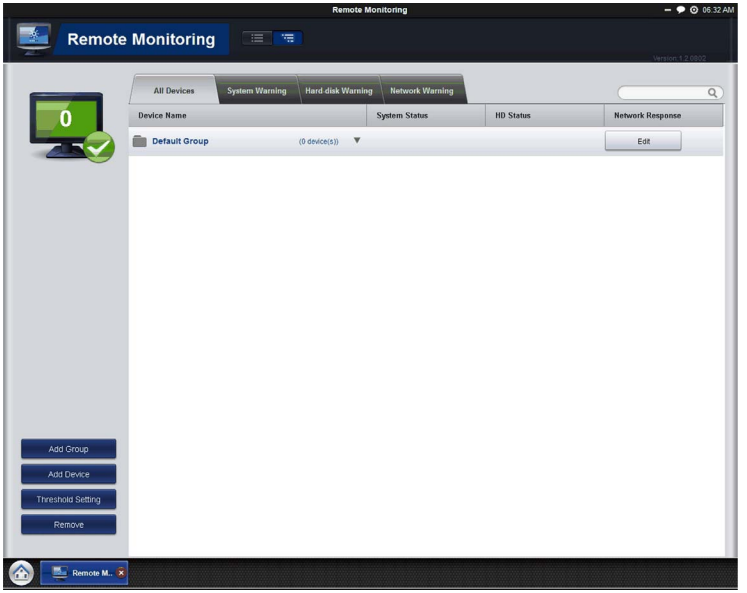
Stage	Description
4	Click **Save & Connect** connect the agent to the **System Monitor** console server: 
5	If you want to see the **Hardware Monitor**, you need to open the **System Monitor Agent**, click the icon in the toolbar: 

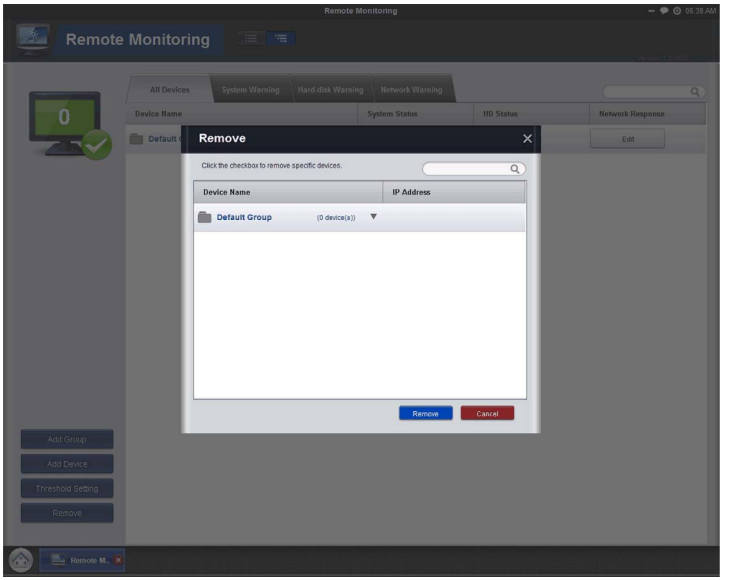
Using System Monitor

Using System Monitor

Using System Monitor

This procedure describes how to use the **System Monitor** user interface:

Stage	Description
1	Search bar: You can search for a device by device name. The list view shows the result.  **Hierarchical** or **List Mode**: click the buttons on the right of the application name to switch between hierarchical and list mode. In hierarchical mode, the devices are divided into groups for easier management. In list mode, all the devices are shown on the same page to provide an overview of all the devices.
2	**Group Tab**: divide into tabs corresponding to information or function. The tabs also display the number of current devices.
3	**Sorting**: click the column header to sort by that information. Default is to sort by device name.
4	**Device item**: shows all device items.
5	**Status count**: shows the values most important to users.
6	**Extended function**: for each user, every remote application has its own customized functions.

Stage	Description
7	Remove devices: If a device is offline for some time and you, do not want it to show up, click **Remove Device**. **NOTE:** If the device comes online, it shows up again. 

Configuration

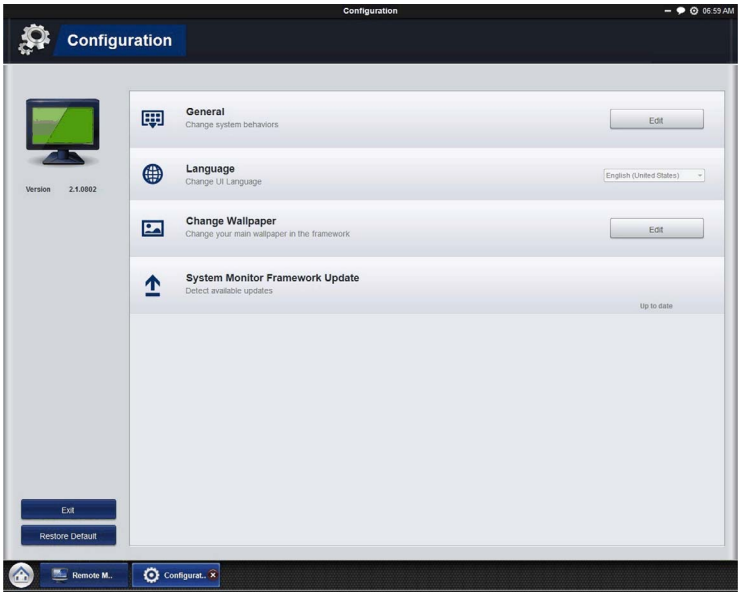
In configuration, you can define settings such as automatic startup, language, wallpaper, and updates.

General (Change system behavior): click **Edit** to set **System Monitor** to start on system tray and then run on the system tray automatically when the operating system starts up.

Language (Change User Interface Language)

Change Wallpaper (Change your main wallpaper in the framework): click **Edit** to select your own wallpaper on the main screen.

System Monitor Console Framework Update (Detect available updates): when the console connects to the Internet and finds a new update on the server, the **Update** icon becomes enabled so you can update online. Sometimes, the update asks you to restart this device when the update is complete.

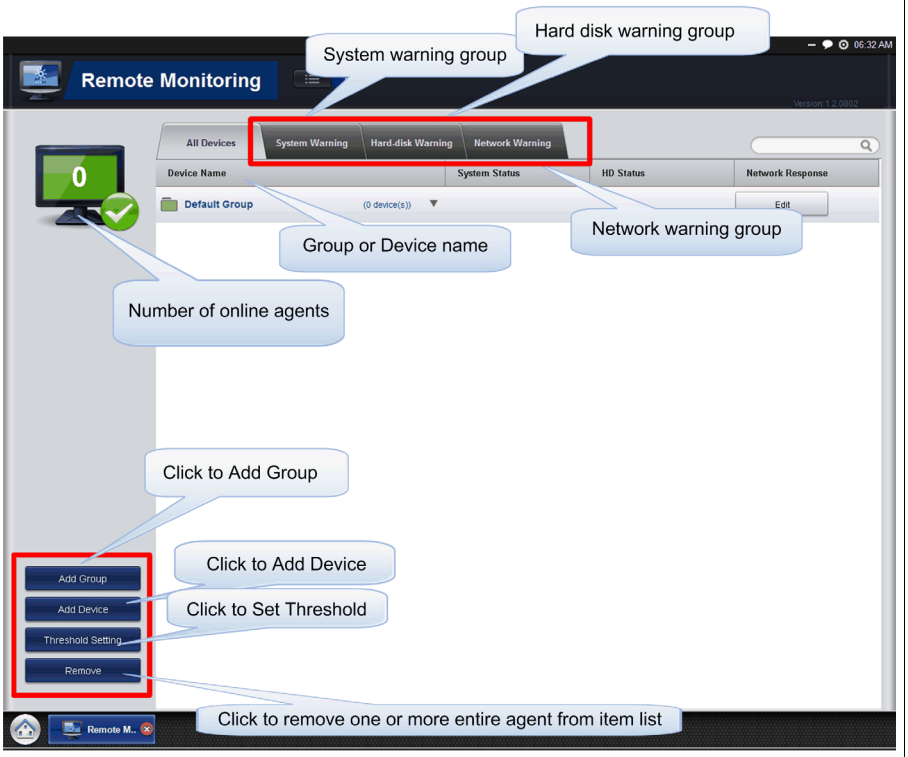


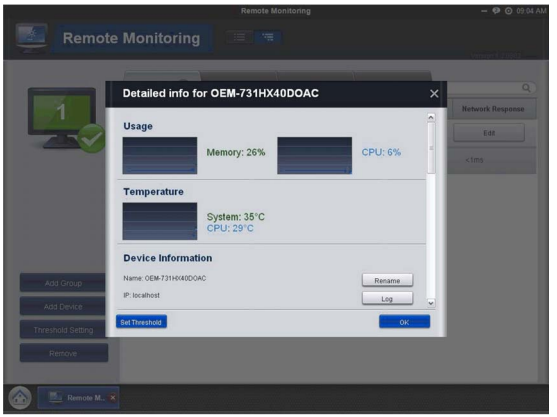
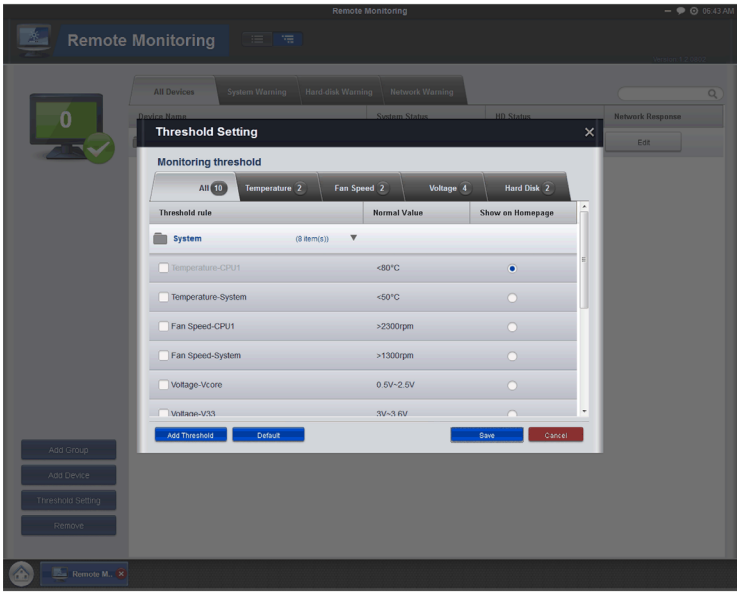
Using Remote Monitoring

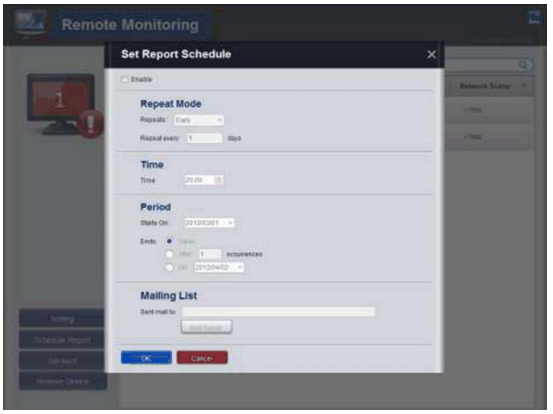
Remote Monitoring

The **Remote Monitoring** application monitors the system status of remote devices, including hard disk temperature, hard drive health, network connection, system / CPU temperatures, system / CPU fan speeds and system voltages. Email alarms and function logs are generated so managers can regularly keep track of their remote devices.

This procedure shows how to access **Remote Monitoring** applications:

Stage	Description
1	Click **Remote Monitoring** icon to run the application. Main application screen.  **Add Group**: create a group name, edit its description, then add devices to a specific group. **Add Device**: click search to scan for devices on the LAN and select the devices to add. **Threshold Setting**: monitoring threshold contains four items: **Temperature**, **Fan Speed**, **Voltage**, and **Hard Disk**. In addition to these defaults, you can add or subtract items from this page. When the status is higher or lower than the threshold, the color of the value changes to red to notify users. **Remove**: if you determine your device or group is not online, click **Remove** to remove it from the list. **Update All Agent**: The console detects the update status of agents once one of the agents in the device list is not up to date. Click the **Update All Agents** icon in the notification area to update all the agents. **Manage device of group**: click **Edit** to add or remove devices. Click **Edit** to edit its group name and related description.

Stage	Description
2	**Detailed Device Status**: click the device to view details such as: CPU/Memory usage, system temperature, CPU temperature, device MAC address, motherboard model, BIOS version, processor model, memory capacity, operating system version, system status, storage status, and network status. 
3	**Monitoring Threshold Settings** Use the **Setting** window to monitor these four threshold settings: Temperature, fan speed, voltage, and hard disk. You can add or remove items from this page. 

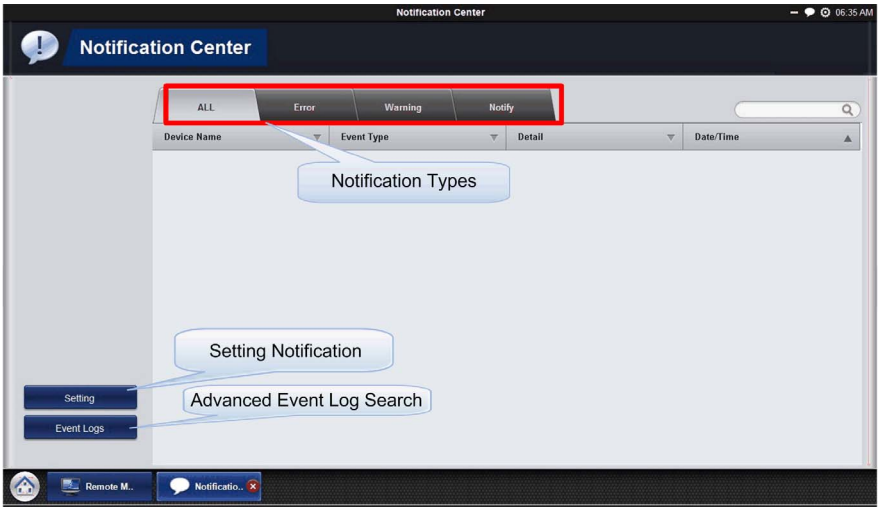
Stage	Description
4	**Set Report Schedule** Use this feature to set up a schedule for distributing run-time reports. Click **Schedule Report** to display the **Set Report Schedule** window. Define the schedule settings such as whether to repeat the operation **Repeat Mode**, when to run the report **Time**, the start and end period of the report **Period**, and the recipients of the report **Mailing list**. Click **OK** to accept the settings. 

Using Notification Center

Notification Center Monitoring

The **Notification Center** application manages the 3 different types of messages: **Error** detected, **Warning**, and **Notify**.

This procedure shows how to use the **Notification Center**:

Stage	Description
1	Click the **Notification Center** icon to run the application. Main application screen.  **All**: List the last 500 logged events on five pages. Use the search feature to search among these 500 logged events. **Setting**: shows advanced notification center settings.
2	**Event Logs**: Click the **Event Logs** icon to search the log. **Search**: You can search all logged events by keyword. **Export**: You can export the results of your search.

Chapter 11
Software API

Intelligent Management for Embedded Platform

Description

This **Software API** (Application Programming Interfaces) is a micro controller that provides embedded features for system integrators. Embedded features have been moved from the OS/BIOS level to the board level to increase reliability and to simplify integration. **Software API** runs whether the operating system is running or not; it can count the boot times and running hours of the device, monitor device health, and provide an advanced watchdog to handle errors found as they happen. **Software API** also comes with a secure and encrypted EEPROM for storing main security keys or other customer defined information. All the embedded functions are configured through an **API** (application programming interface) or by a **DEMO** tool. Schneider Electric provides this suite of **Software API** and the underlying drivers required. Also a set of user-friendly, intelligent, and integrated interfaces speed development, enhance security, and offer add-on value for Schneider Electric platforms.

NOTE: To use the watchdog and GPIO functions you need to use the software API as described into Schneider Electric software API user manual available in .pdf format on the documentation DVD.

Chapter 12
Maintenance

Subject of this Chapter

This chapter covers maintenance of the Rack iPC.

What Is in This Chapter?

This chapter contains the following topics:

Reinstallation Procedure

Introduction

In certain cases, it may be necessary to reinstall the operating system.

Precautions to take:

- Keep static-producing materials (plastic, upholstery, carpeting) out of the immediate workpace.
- Do not remove ESD-sensitive components from their anti-static bags until you are ready to install them.
- When handling static-sensitive components, wear a properly grounded wrist strap (or equivalent).
- Avoid contact with exposed conductors and component leads.

Before Reinstallation

Hardware required:

- Recovery media, refer to the leaflet of the recovery media.

Setting up the hardware:

- Shut down the operating system in an orderly fashion and remove all power from the device.
- Disconnect all external peripherals.

NOTE: Save all main data onto a hard drive or a memory card. The reinstallation process returns the computer to its factory settings and erases all data.

Reinstallation

Refer to the procedure in the leaflet provided with the recovery media.

Regular Cleaning and Maintenance

Introduction

Inspect the Rack iPC periodically to determine its general condition. For example:

- Are all power cords and cables connected properly? Have any become loose?
- Are all installations holding the unit securely?
- Is the ambient temperature within the specified range?

The following describes service/maintenance work which can be carried out by a trained, qualified user.

⚠ ⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

- Remove all power from the device before removing any covers or elements of the system, and prior to installing or removing any accessories, hardware, or cables.
- Unplug the power cable from both the Harmony Industrial PC and the power supply.
- Always use a properly rated voltage sensing device to confirm that power is off.
- Replace and secure all covers or elements of the system before applying power to the unit.
- Use only the specified voltage when operating the Harmony Industrial PC. The AC unit is designed to use 100...240 Vac input.

Failure to follow these instructions will result in death or serious injury.

Cleaning Solutions

⚠ CAUTION

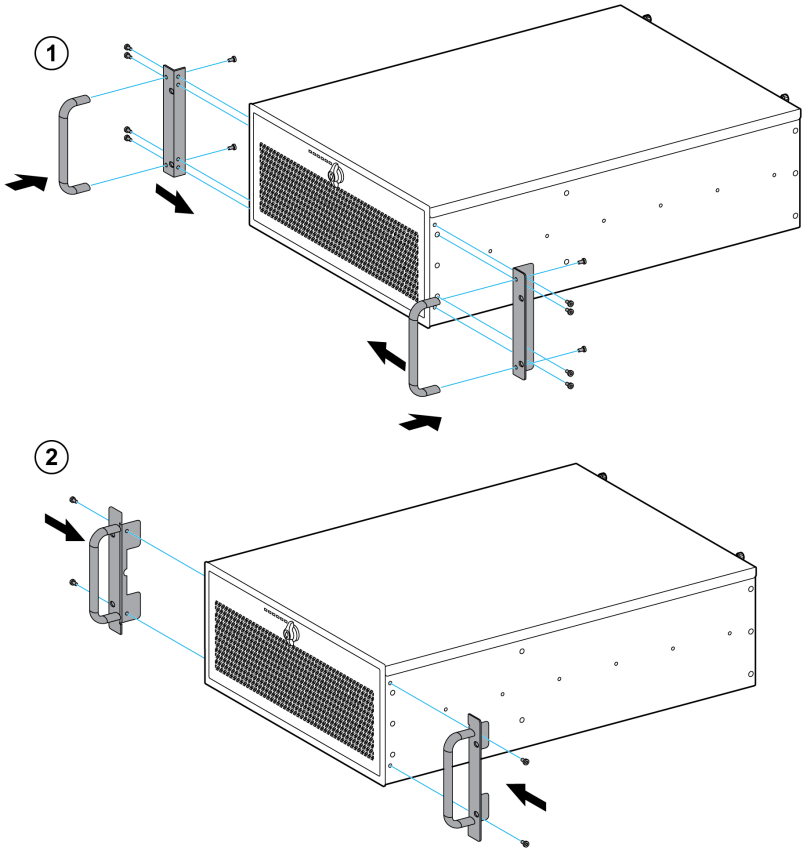
HARMFUL CLEANING SOLUTIONS

Do not clean the unit or any component of the unit with paint thinner, organic solvents, or strong acids.

Failure to follow these instructions can result in injury or equipment damage.

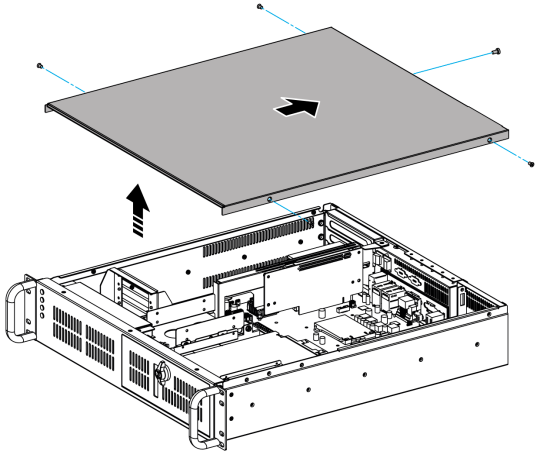
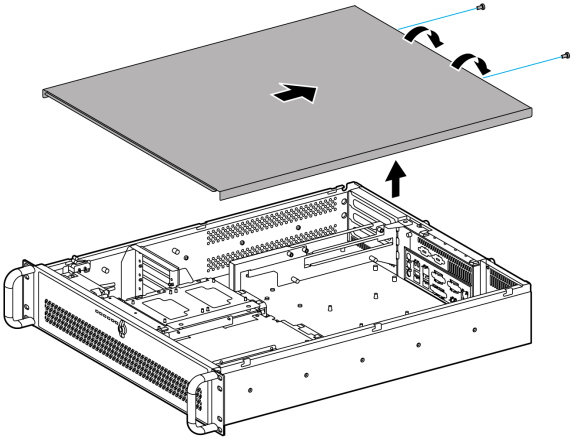
Attaching the Ears and Handles

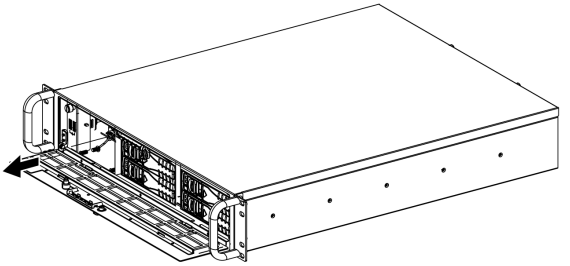
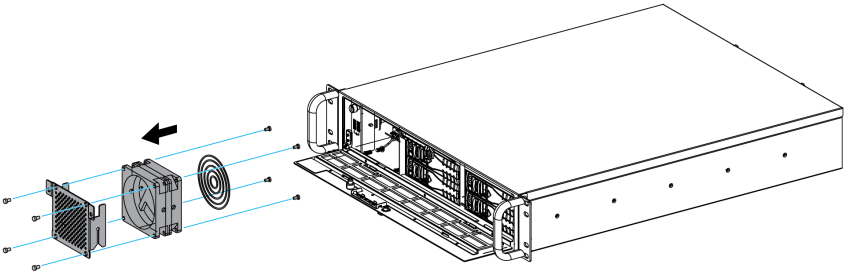
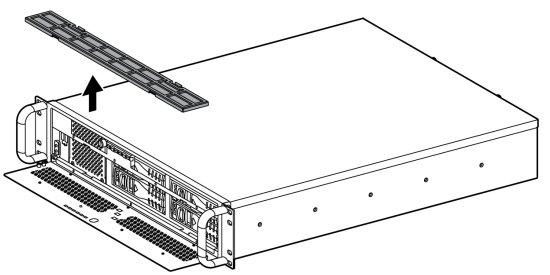
There is a pair of ears and handles in the accessory box. Fasten them to the front-right and front-left mounting ears with the screws provided:

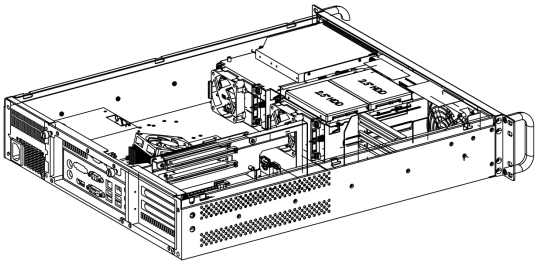
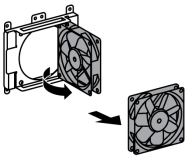


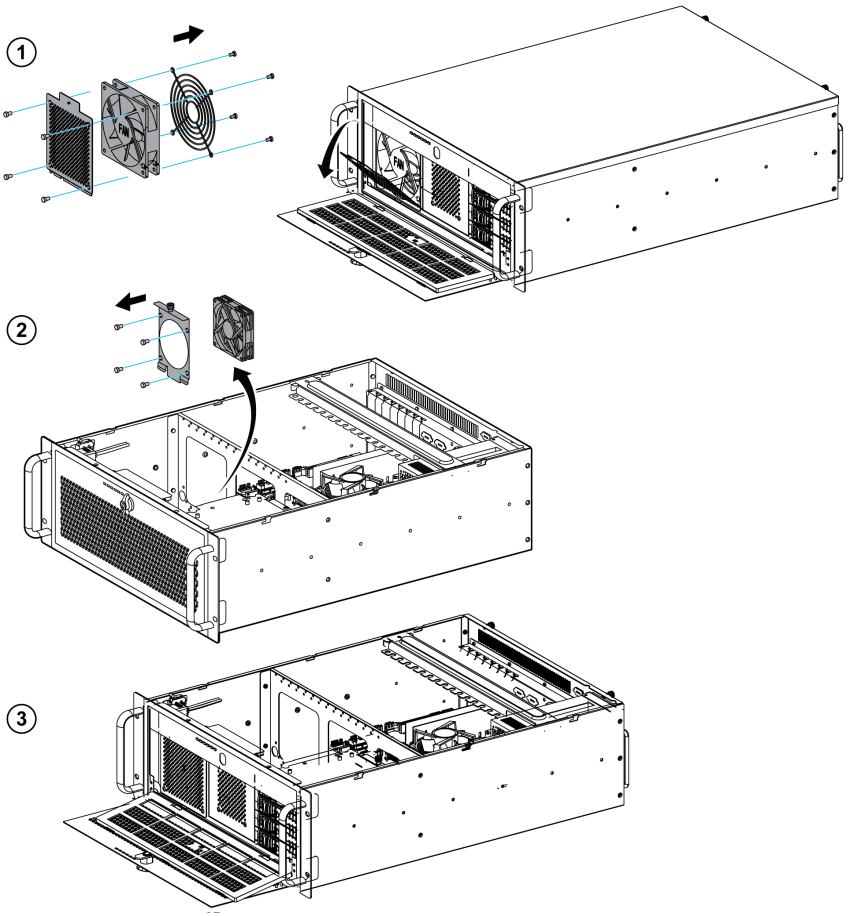
Fan and Filter Cover

Step	Action
1	Disconnect the power supply to the Harmony Rack iPC.
2	Touch the housing or ground connection (not the power supply) to discharge any electrostatic charge from your body.
3	Loosen two screws on the rear of the top cover for the Rack iPC Performance and Universal. Loosen five screws on the rear and both sides of the top cover for the Rack iPC Optimized.

Step	Action
4	Slide the top cover backwards and then lift it up Rack iPC Optimized:  Slide the top cover backwards and then lift it up for the Rack iPC Performance and Universal: 

Step	Action
5	Press in the marked latching mechanism as you pull out the filter cover for the Rack iPC Optimized and Universal: 1  2  3  **1** Take out the fan bracket **2** Replacing system fan **3** Removing the filters

Step	Action
6	Replacing the internal fan for the Rack iPC Universal: 1  2  **1** Replacing the fan behind the SAS/SATA HDD backplane **2** Remove the fan from the plastic bracket

Step	Action
7	Replacing the system cooling fan for the Rack iPC Performance:  **1** Replacing the system cooling fan (without removing the top cover) **2** Replacing HDD fan **3** Removing the filters
8	Reinstall the top cover and tighten the screws.

Lithium Battery

The Rack iPC contains one battery, which is needed for backing up the real-time clock (RTC).

NOTE: The following characteristics, features, and limits only apply to this accessory and can deviate from those specified for the entire device. For the device where this accessory is installed, refer to the data provided specifically for the device.

Features	Values
Type	BR2032
Capacity	200 mAh
Voltage	3 Vdc
Self discharge at 23 °C (73.4 °F)	< 1 % per year
Storage time	Maximum 3 years at 30 °C (86 °F)
Environmental characteristics	
Operation temperature range	–30...80 °C (–22...176 °F)
Relative humidity	90 % non-condensing

Replacing the Battery

⚠ ⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Read and understand the safety information in the regular cleaning and maintenance section before attempting this procedure.

Failure to follow these instructions will result in death or serious injury.

⚠ DANGER

EXPLOSION, FIRE, OR CHEMICAL HAZARD

- Replace battery with identical type.
- Follow all battery manufacturers' instructions.
- Remove all replaceable batteries before discarding unit.
- Recycle or properly dispose of used batteries.
- Protect battery from any potential short circuit.
- Do not recharge, disassemble, heat above 100 °C (212 °F), or incinerate.
- Use your hands or insulated tools to remove or replace the battery.
- Maintain proper polarity when inserting and connecting a new battery.

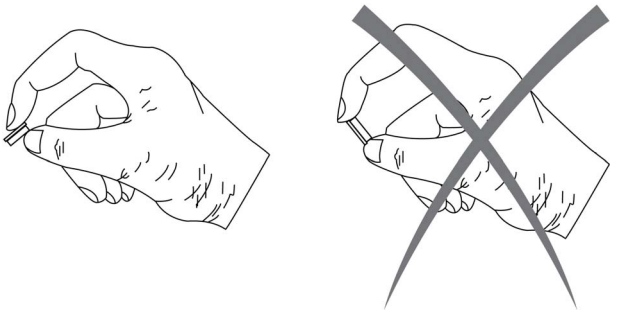
Failure to follow these instructions will result in death or serious injury.

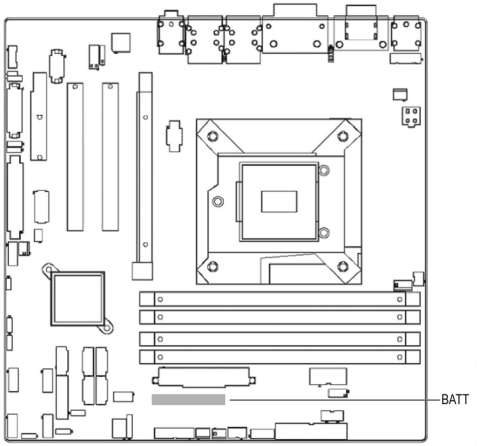
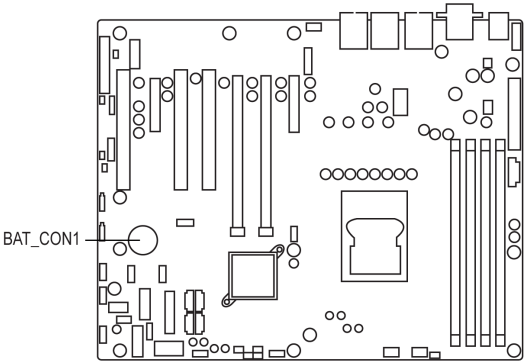
NOTE: Replacement of the battery in the Harmony Industrial PC other than with the type specified in this document may present a risk of fire or explosion.

⚠ WARNING
IMPROPER BATTERY CAN PROVOKE FIRE OR EXPLOSION
Replace battery only with identical type.
Failure to follow these instructions can result in death, serious injury, or equipment damage.

NOTE:

- Saved settings are restored when changing the battery with the power turned off (the settings are stored in non-volatile EEPROM). However, the date and time must be reset because this data is lost when changing the battery.
- Only qualified personnel can change the battery.

Step	Action
1	Disconnect the power supply to the Harmony Rack iPC.
2	Touch the housing or ground connection (not the power supply) to discharge any electrostatic charge from your body.
3	The battery should not be held by its edges. Insulated tweezers may also be used for inserting the battery. 

Step	Action
4	Insert the new battery with correct polarity Rack iPC Universal and Optimized:  Insert the new battery with correct polarity of the Rack iPC Performance: 
5	Reconnect the power supply to the Rack iPC (plug in power cable and press power button).
6	You may need to reset the date and time in the BIOS settings.

Appendices

Subject of this Part

This part provides the accessories for the Harmony Rack iPC products, the mounting jumpers of the main board and the software utilities.

What Is in This Appendix?

The appendix contains the following chapters:

Appendix A
Accessories

Accessories for the Rack iPC

Available Accessories

Accessories are available as options. The list of accessories available for the Rack iPC is shown below:

Reference	Description	Content/Comment
HMIYRMKT2O1	Maintenance kit for Rack iPC 2U Optimized	USB cable, fans and holders, filters, mother board screws, HDD screws, SATA cables, and door keys
HMIYRMKT2U1	Maintenance kit for Rack iPC 2U Universal	
HMIYRMKT4P1	Maintenance kit for Rack iPC 4U Performance	
HMIYRMAC21	Power supply 300 W for 2U	Rack PC 2U
HMIYRMAC41	Power supply 500 W for 4U	Rack PC 4U
HMIYRMRC41	Spare AC module 500 W for redundant 4U	
HMIYPRAM3040R1	RAM expansion DDR3 4 GB	
HMIYPRAM3080R1	RAM expansion DDR3 8 GB	
HMIYPRAME040R1	RAM expansion ECC 4 GB	Rack PC with OS server only
HMIYPRAME080R1	RAM expansion ECC 8 GB	
HMIYHDD500R1	Hard disk drive 500 GB blank	24/7 - including mounting screws
HMIYHDD01TR2	Hard disk drive 1 TB blank	
HMIYSSDS080S1	SSD 80 GB	SSD 80 GB (Intel) including mounting screws
HMIYSSDS160S1	SSD 160 GB	SSD 160 GB (Intel) including mounting screws
HMIYRCABPWRCN1	Power cable for China	US and Europe power cord default on rack
HMIYRINSL21	4 Serial Line kit for Rack iPC 2U	4 cables 2 PCI brackets with 2 communication ports each
HMIYRINSL41	4 Serial Line kit for Rack iPC 4U	PCB, screws and 2 x 2 communication ports

Appendix B
Motherboards, Interface Connections and Mounting Jumpers

This chapter provides the description of the motherboard, the interface connections, and the mounting jumpers.

What Is in This Chapter?

This chapter contains the following sections:

Section B.1
Motherboard Rack iPC Universal and Optimized

Overview

This section describes the mother board, the interface connections, and the mounting jumpers of the motherboard Rack iPC Universal and Optimized.

What Is in This Section?

This section contains the following topics:

Description of the Rack iPC Universal and Optimized Motherboard

Rack iPC Universal and Optimized Board Introduction

The Rack iPC Universal and Optimized motherboards are designed with the Intel® Q77/C216 chipsets used for industrial applications that require both performance computing and enhanced power management capabilities.

Board Features

The Intel® Q77/C216 based board provides:

- Rich I/O connectivity: Dual GbE LAN via PCIe x1 bus, 2 PCI 32- bit/33 MHz PCI slots, 1 PCIe x16 slot (Gen 3), 1 PCIe x4 slot (Gen 2), 8 USB 2.0 ports and 4 USB 3.0 ports.
- Standard micro ATX form factor with industrial features: The Rack iPC Universal and Optimized use a full featured micro ATX motherboard with balanced expandability and performance.
- Wide selection of storage devices: SATA HDD, customers benefit from the flexibility of using the most suitable storage device for larger capacity
- Optimized integrated graphic solution: The Intel® flexible display interface supports versatile display options and a 32-bit 3D graphics engine.

Rack iPC Universal System

The Universal system has:

- CPU processor: Intel® Core i3 2120 3.3 GHz
- BIOS: AMI EFI 64 Mbit/s SPI BIOS
- System chipset: Intel® Q77/C216
- SATA hard disk drive interface: Four on-board SATA connectors with data transmission rate up to 300 Mbit, and 2 on-board SATA connectors with data transmission rate up to 600 Mbit

Rack iPC Optimized System

The Optimized system has:

- CPU processor: Intel® Pentium G850 2.9 GHz/Celeron G540 2.5 GHz
- BIOS: AMI EFI 64 Mbit/s SPI BIOS
- System chipset: Intel® Q77/C216
- SATA hard disk drive interface: Four on-board SATA connectors with data transmission rate up to 300 Mbit, and 2 on-board SATA connectors with data transmission rate up to 600 Mbit

Memory

RAM: Up to 32 GB in 4 slots 240-pin DIMM sockets. Supports dual-channel DDR3 1333/1600 MHz SDRAM.

The Rack iPC supports either ECC buffered DIMMs or non-ECC unbuffered DIMMs. The Rack iPC does not support both ECC and non-ECC DIMMs in the same configuration.

Input/Output

- PCIe slot: 1 PCIe x16 expansion slot, 1 PCIe x4 expansion slot
- PCI bus: 2 PCI slots, 32-bit/33 MHz PCI 2.2 compliant
- Enhanced parallel port: Configured to LPT1 or disabled. Standard DB-25 female connector cable is an optional accessory. LPT1 supports EPP/SPP/ECP.
- Serial ports on rear panel: RS-232/422/485 with hardware auto-flow control, 4 RS-232, and 1 RS-232 sub-DB9 connectors.
- Keyboard and PS/2 mouse connector: 2 x 6-pin mini-DIN connectors located on the mounting bracket for easy connection to a PS/2 keyboard and mouse.
- USB port: Supports up to 8 USB 2.0 ports with transmission rates up to 480 Mbps/s and 4 USB 3.0 ports with transmission rates up to 5 Gbps.
- GPIO: Rack iPC Universal and Optimized support 8-bit GPIO from super I/O for general-purpose control applications.

Graphics

- Controller: Intel® HD graphics
- Display memory: 1 GB maximum shared memory when 2 GB or more of system memory is installed
- DVI: Supports DVI up to 1920 x 1200 resolution at 60 Hz refresh rate
- VGA: Supports VGA up to 2048 x 1536 resolution at 75 Hz refresh rate
- LVDS: Supports LVDS up to resolution 1920 x 1200
- Display port: Supports a maximum resolution of 2560 x 1600 at 60 Hz
- eDP: Supports a maximum resolution of 1920 x 1200 at 60 Hz
- Triple display: VGA+eDP (or LVDS)+DP, VGA+eDP(or LVDS)+DVI, VGA+DP+DVI
- Dual display: VGA+eDP (or LVDS), VGA+DVI, eDP(or LVDS)+DVI, VGA+DP, DP+ DVI, LVDS+DP

Ethernet LAN

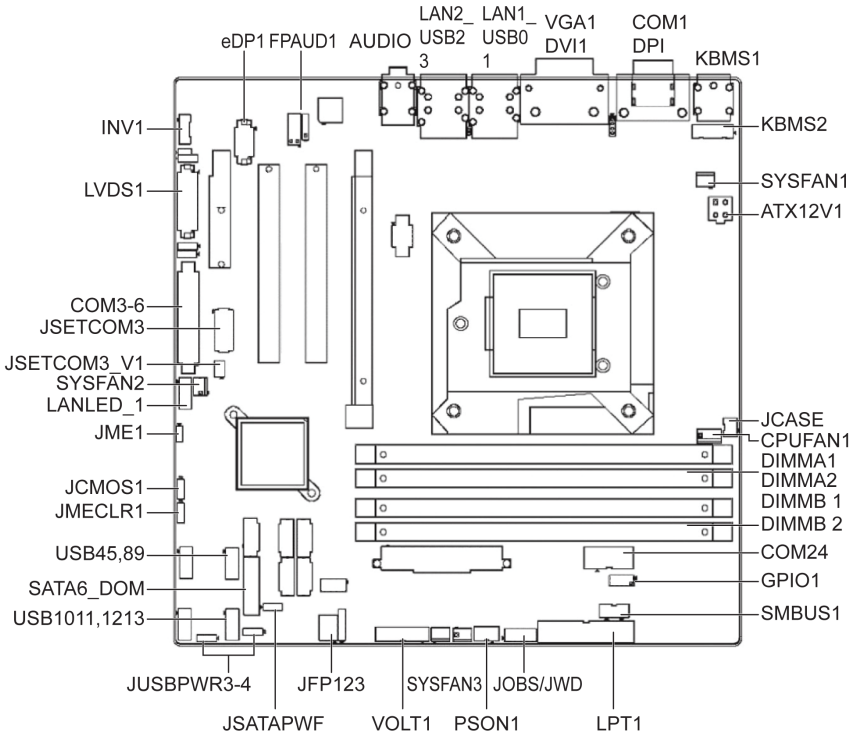
- Supports dual 10/100/1000 Mbps/s Ethernet ports via PCI express x 1 bus which provides 500 MB/s data transmission rate.
- Controller: LAN1: Intel® 82579LM; LAN2: Intel® 82583 V

Industrial Features

- Watchdog timer: Used to generate a system reset. The watchdog timer is programmable, with each unit equal to 1 second or 1 minute (255 levels)

Board Features and Board Layout

The figure shows Universal and Optimized board layout, jumper, and connector locations:



The table lists the Rack iPC Universal and Optimized jumpers and their function:

Label	Function
JFP1	Power switch/HDD LED/SMBus/speaker
JFP2	Power LED and keyboard lock
CMOS1	CMOS clear (default 1-2)
PSON1	AT(1-2) / ATX(2-3) (default 2-3)
JWDT1+JOBS1	Watchdog reset and OBS alarm
JCASE1	Case open pin header
JLVDS1	Voltage 3.3 V/5 V/12 V selector for LVDS1 connector (default 1-2, 3.3 V)
JLVDS_CLT1	Brightness control selector for analog or digital (default 1-2, analog)
JEME1	Intel AMT disable jumper
JMECLR1	Clear AMT setting

Label	Function
JUSBPWR1	USB port 0-1 power source switch between +5 Vsb and +5 V
JUSBPWR2	USB port 2-3 power source switch between +5 Vsb and +5 V
JUSBPWR3	USB port 4/5/8/9 power source switch between +5 Vsb and +5 V
JUSBPWR4	USB port 10/11/12/13 power source switch between +5 Vsb and +5 V

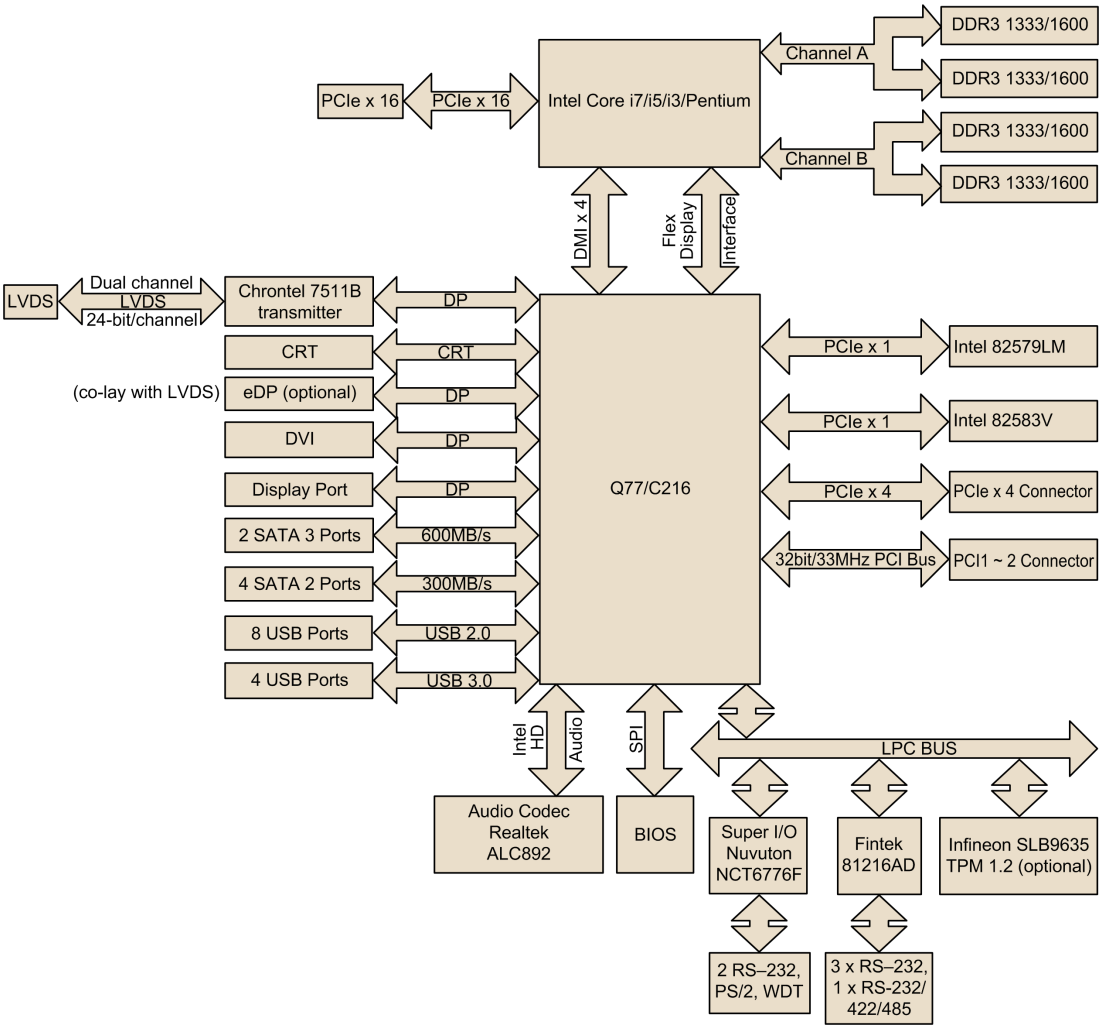
The table lists the Rack iPC Universal and Optimized connectors and their function:

Label	Function
LPT1	Parallel port, supports SPP/EPP/ECP mode
LVDS1	LVDS1 connector
INV1	LVDS1 inverter connector
COM3456	Serial port connectors (RS-232)
USB45	USB port 4, 5 (on board)
USB89	USB port 8, 9 (on board)
USB1011	USB port 10, 11 (on board)
USB1213	USB port 12, 13 (on board)
VGA	VGA connector
COM1	Serial port connector (RS-232)
KBMS1	PS/2 keyboard and mouse connector
CPUFAN1	CPU FAN connector(4-pin)
SYSFAN1	System FAN1 connector(3-pin)
SYSFAN2	System FAN2 connector(3-pin)
SYSFAN3	System FAN3 connector(3-pin)
SYSFAN4	System FAN4 connector(3-pin)
LAN1_USB01	LAN1 / USB port 0, 1
LAN2_USB23	LAN2 / USB port 2, 3
AUDIO1	Audio connector
SPDIF_OUT1	SPDIF audio out pin header
FPAUD1	HD audio front panel pin header
PCIEX16_1	PCIe x16 slot
SATA1	Serial ATA data connector 1
SATA2	Serial ATA data connector 2
SATA3	Serial ATA data connector 3
SATA4	Serial ATA data connector 4
SATA5	Serial ATA data connector 5

Label	Function
SATA6	Serial ATA data connector 6
DIMMA1	Channel a DIMM1
SPI_CN1	SPI flash update connector.
GPIO1	GPIO header
ATX12V1	ATX 12 V auxiliary power connector (for CPU)
ATXPWR1	ATX 20-pin main power connector (for system)
DVI	DVI-D connector on rear panel
COM2	Serial port COM2, pin header 2x5
EDP1	eDP connector (2x10 pin header)
JTAG	Joint test action group connector 2x5 P
SMBUS1	SMBUS expansion pin header 1x4 P

Block Diagram

The figure shows the block diagram of the Universal and Optimized motherboards:



Interface Connections of the Rack iPC Universal and Optimized

Introduction

⚠ WARNING

EQUIPMENT DISCONNECTION OR UNINTENDED EQUIPMENT OPERATION

- Ensure that power, communication, and accessory connections do not place excessive stress on the ports. Consider the vibration in the environment.
- Securely attach power, communication, and external accessory cables to the panel or cabinet.
- Use only D-Sub 9-pin connector cables with a locking system in good condition.
- Use only commercially available USB cables.

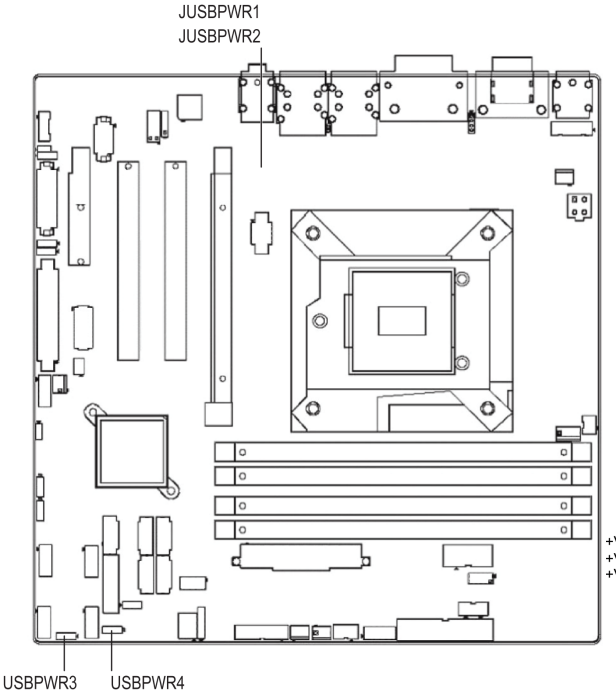
Failure to follow these instructions can result in death, serious injury, or equipment damage.

USB Ports (USB01, USB23, USB45, USB89, USB1011, USB1213)

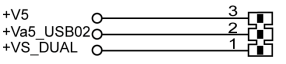
The Rack iPC provides 4 USB 3.0 interface connectors, which give complete plug and play and hot swapping for up to 127 external devices. The USB interface complies with USB UHCI, Rev. 2.0. The USB interface can be disabled in the system BIOS setup. The USB connectors are used to connect any device that conforms to the USB interface. Most digital devices conform to this standard. The USB interface supports plug and play.

USB Power Switch

The Rack iPC allows users to set the USB power between +5 VSB and +5 V. When the jumper is set to +5 V (default 2-3 pin), the board does not support wake from S3 by keyboard or mouse. If you need to set as +5 Vsb, change the jumper (1-2 pin) and modify the customized BIOS at the same time.



Jumper	USB Ports
JUSBPWR1	USB Port 1-4
JUSBPWR2	USB Port 5/6/7/8/11/12



1-2* Pin is default

USB Ports (LAN1, LAN2)

The Rack iPC is equipped with 2 high-performance 1000 Mbit/s Ethernet LAN adapters, both of which are supported by all major network operating systems. The RJ45 jacks on the rear panel provide convenient LAN connection.

VGA/DVI-D Connector (VGA1, DVI1)

The Rack iPC includes VGA and DVI interfaces that can drive conventional VGA and DVI displays. VGA is a standard Sub-D15 connector commonly used for VGA.

Serial Ports (COM1, COM2)

This interface is used to connect Rack iPC to remote equipment, via a cable with a Sub-D9 male connector.

The Rack iPC provides a Sub-D9 connector, which offers RS-232/422/485 serial communication interface ports.

You can change the RS-422/485 communication mode from the BIOS setting: **Advanced BIOS Features Setup → Super IO Configuration**.

By using a long PLC cable to connect to the Rack iPC, it is possible that the cable can be at a different electrical potential than the panel, even if both are connected to ground.

The Rack iPC serial port is not isolated. The SG (signal ground) and the functional ground (FE) terminals are connected inside the panel.

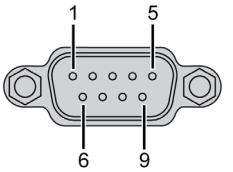
⚠ ⚠ DANGER

ELECTRIC SHOCK

- Make a direct connection between the ground connection screw and ground.
- Do not connect other devices to ground through the ground connection screw of this device.
- Install all cables according to local codes and requirements. If local codes do not require grounding, follow a reliable guide such as the US national electrical code, article 800.

Failure to follow these instructions will result in death or serious injury.

The table shows the Sub-D9 connector pin assignments:

Pin	Assignment			
	RS-232	RS-422	RS-485	
1	DCD	TX-	DATA-	Sub-D9 male connector: 
2	RXD	TX+	DATA+	
3	TXD	Rx+	–	
4	DTR	RX-	–	
5	GND	GND	GND	
6	DSR	–	–	
7	RTS	–	–	
8	CTS	–	–	
9	RI	–	–	

NOTE: Any excessive weight or stress on communication cables may disconnect the equipment.

Display Port (DP1)

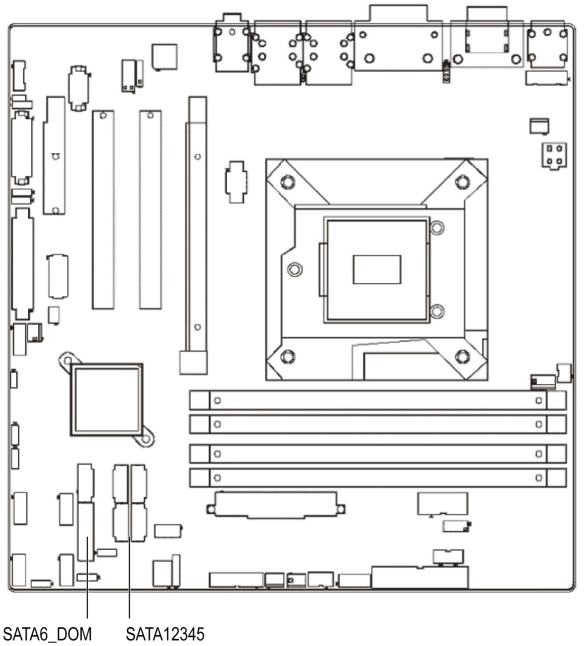
The Rack iPC has an external display port connector to support the display panel.

PS/2 Keyboard and Mouse Connector (KBMS1)

Two 6-pin mini-DIN connectors (KBMS1) on the motherboard provide connection to a PS/2 keyboard and a PS/2 mouse, respectively. KBMS2 is for supporting the second PS/2 keyboard and PS/2 mouse by a cable P/N 1700018699.

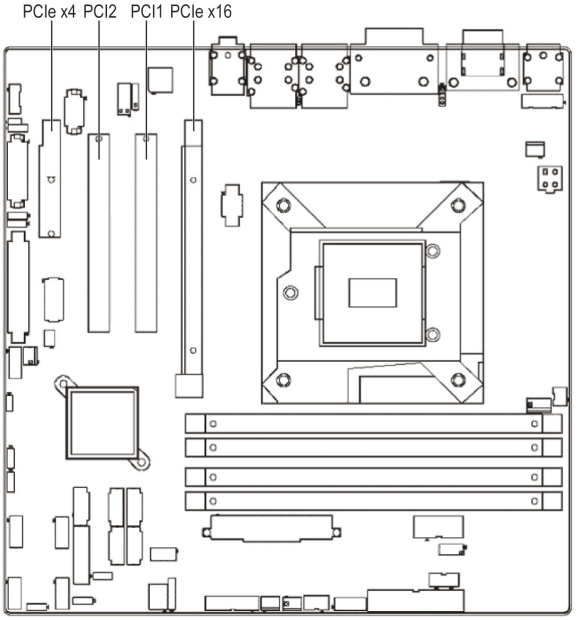
Serial ATA Interface (SATA1...6)

The Rack iPC features a high performance serial ATA interface (up to 300 MB/s) and serial ATA III interface (up to 600 MB/s) which eases hard drive wiring with thin, space-saving cables.



PCI and PCI Express Slots

The Rack iPC provides a PCIe x4 slot, a PCIe x16 slot and 2 PCI slots for users to install add-on cards when their applications require higher graphic performance than the embedded graphics controller CPU can provide.



Mounting Jumpers of the Rack iPC Universal and Optimized

Overview

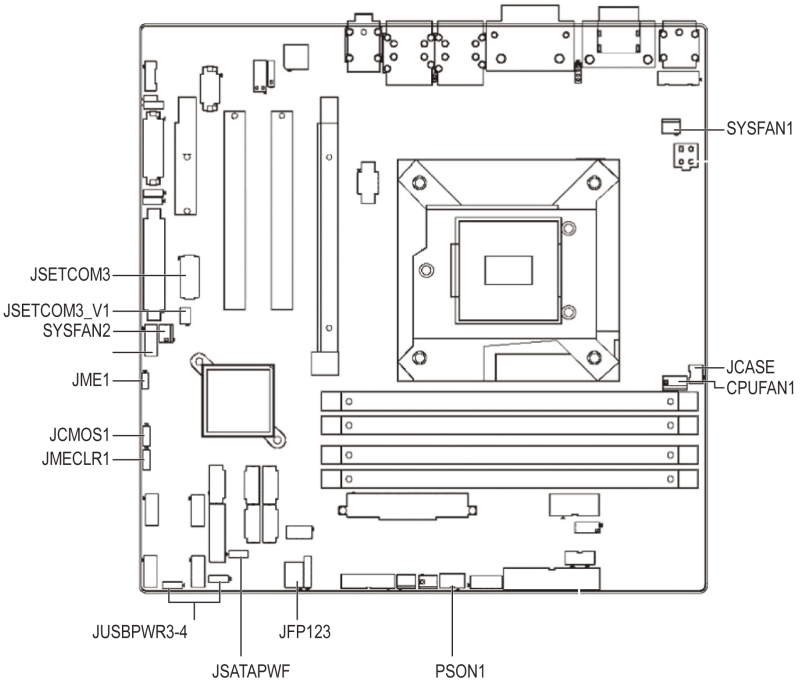
You may configure the Rack iPC Universal and Optimized to match the needs of your application by setting jumpers.

NOTE: A pair of needle-nose pliers may be helpful when working with jumpers.

Jumpers and Connectors

Connectors on the Rack iPC motherboard link it to devices such as hard disk drives and a keyboard. In addition, the board has a number of jumpers used to configure your system for your application. The tables below list the function of each of the board jumpers and connectors. Later sections in this chapter give instructions on setting jumpers.

The figure shows the Rack iPC Universal and Optimized jumpers and connectors:



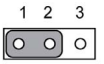
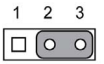
The table lists the Rack iPC Universal and Optimized jumpers and their function:

Label	Function
JFP1	Power switch/HDD LED/SMBus/speaker
JFP2	Power LED and keyboard lock
CMOS1	CMOS clear (default setting 1-2)
PSON1	AT(1-2) / ATX(2-3) (default setting 2-3)
JWDT1+JOBS1	Watchdog reset and OBS alarm
JCASE1	Case open pin header
JLVDS1	Voltage 3.3 V/5 V/12 V selector for LVDS1 connector (default setting 1-2, 3.3 V)
JLVDS_CLT1	Brightness control selector for analog or digital (default setting 1-2, analog)
JEME1	Intel AMT disable jumper
JMECLR1	Clear AMT setting
JUSBPWR1	USB port 0-1 power source switch between +5 Vsb and +5 V
JUSBPWR2	USB port 2-3 power source switch between +5 Vsb and +5 V
JUSBPWR3	USB port 4/5/8/9 power source switch between +5 Vsb and +5 V
JUSBPWR4	USB port 10/11/12/13 power source switch between +5 Vsb and +5 V

CMOS Clear

The Rack iPC motherboard contains a jumper that can erase CMOS data and reset the system BIOS information. Normally this jumper should be set with pins 1-2 closed. If you want to reset the CMOS data, set CMOS1 to 2-3 closed for just a few seconds, and then move the jumper back to 1-2 closed. This procedure resets the CMOS to its default setting.

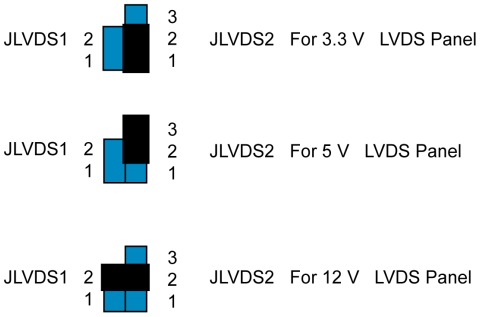
The table shows the CMOS clear data:

Function	Jumper setting
Keep CMOS data (default setting)	
Clear CMOS data	

JLVDS1-2: LCD Power 3.3 V/ 5 V/ 12 V Selector

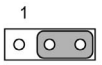
The table shows the LCD power selector:

Closed pins	Result
JLVDS2, 1-2	Jumper for +3.3 V
JLVDS2, 2-3	Jumper for +5 V
JLVDS1, 2 JLVDS2, 2	Jumper for +12 V



JUSBPWR1-4 (USB Power Selection Connector)

The figure shows the USB power selection connector:



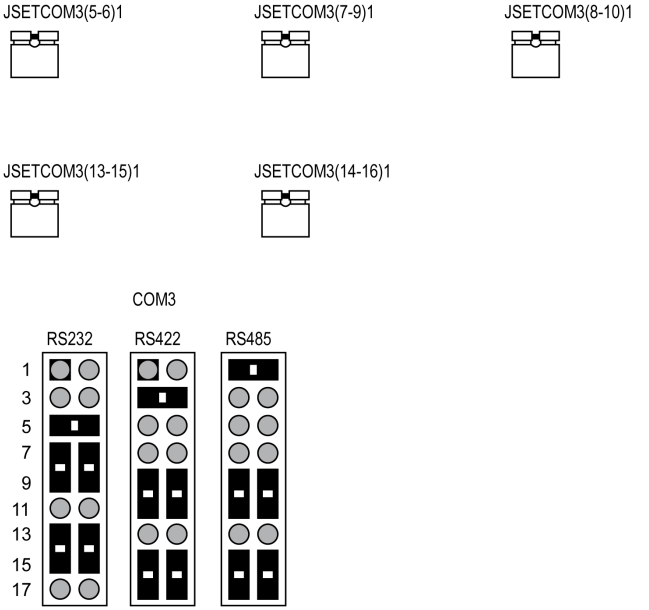
Default setting: Pin 2-3 (+5 V)

The table describes the USB power selection connector:

Pin	Pin name
1	+V5_DUAL
2	+V5_USB
3	+V5

Serial Ports COM3

The figure shows the COM3 selection connector:



PSON1: ATX, AT Mode Selector

The table describes the ATX,AT mode selector:

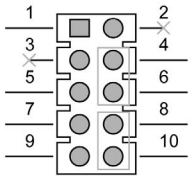
Closed pin	Result
1–2	AT mode
2–3 (default setting)	ATX mode

Watchdog Timer Output and OBS Alarm Option

The table describes the timer output and alarm option:

Pin	Pin name
1	+5 V
2	NC
3	NC
4	SIO_WG
5	SIO_IRRX
6	SRST#

Pin	Pin name
7	GND
8	ERR_BEEP
9	SIO_IRTX
10	OBS_BEEP



BIOS Update ME Mode Selector

JME1 jumper enables users to select BIOS update freely without lock protection when using ADVSPI or with lock protection.

Function	Jumper setting	BIOS protect	Master region access control	Update tool	ME version	ME function after update	Setting	JME1 PWR working status
Production*	(1-2) pin closed	None	FF	ADVSPI	updated	Link/remote control	default	AC on/stdby
	–	Lock Read:0B Write:0A	ADVSPI	Not updated	Link/remote control	OEM request	AC on/stdby	–
Manufacture mode	(2-3) pin closed	None	FF	ADVSPI	Updated	None	None	None

* In the default production mode, there is no lock protection for BIOS. The master region access control setting is FF, users can update the complete BIOS with the ADVSPI tool. The function is same as manufacture mode. BIOS ME (Management engine) function keeps link/remote control. The jumper can be set under AC off PWR status; it cannot be set under standby PWR status.

In production mode with lock protection for BIOS, the master region access control setting is Read:0B, Write:0A. Users cannot update BIOS ME firmware freely. BIOS ME (Management engine) function keeps link/remote control. This setting is only for OEM project requests. The jumper can be set under AC off PWR status, it cannot set under standby PWR status.

In manufacture mode, BIOS has no lock protection function. The master region access control setting is FF, users can update complete BIOS with ADVSPI tool. However, the BIOS ME function does not keep the link/remote control after the BIOS been updated.

Case Open Sensor

The Rack iPC motherboard contains a jumper that provides a chassis open sensor. The buzzer on the motherboard beeps when the case is opened.

PCI Bus Routing Table

AD PCI slot INT	PCI1 AD16	PCI2 AD21
A	A	F
B	B	G
C	C	H
D	D	E

Mounting Jumper Clips

The steps describe the mounting of jumper of the Rack iPC Universal and Optimized:

Step	Action
1	Remove the power.
2	Insert the jumper.

Jumper Setting

The table describes the setting for the low voltage differential signaling (LVDS) power setting:

CN17	LVDS power
Setting	Function
1-3 2-4	VDD_DSUB (pin 7 and pin 20) of LVDS pin is 5 Vdc
3-5 4-6	VDD_DSUB (pin 7 and pin 20) of LVDS pin is 3.3 Vdc

The table describes the setting for the clear CMOS setting:

CN3	Clear CMOS
Setting	Function
–	Normal (default setting)
1-2	Clear CMOS

Section B.2
Motherboard Rack iPC Performance

Overview

This section describes the mother board, the interface connections, and the mounting jumpers of the Rack iPC Performance.

What Is in This Section?

This section contains the following topics:

Description of the Rack iPC Performance Motherboard

Introduction

The Rack iPC Performance motherboard is the advanced Intel® C216 board used for industrial server grade applications that require high-performance computing. The motherboard has an Intel® 4-Core Xeon® E3 processor. High reliability and outstanding performance make the Rack iPC an ideal platform for industrial networking applications.

Board Features

The following is a description of the Rack iPC Performance motherboard features:

- PCIe architecture: The Intel® C216 PCH chipset supports 2 PCIe x16 slots (Gen III x8 link), 2 PCIe x4 slot.
- High performance I/O capability: 4 GB LAN via PCIe bus, 3 PCI 32-bit/ 33 MHz PCI slots, 4 USB 3.0,10 USB 2.0 ports. (2 Type A USB 2.0), 2 SATA III and 4 SATA II connectors.
- Standard ATX form factor with industrial features: long product life, reliable operation under wide temperature range, watchdog timer functions, etc.
- Automatic power-on after power outage: These industrial motherboards allow users to set the system to power on automatically after a power outage. Refer to the detailed "AT" mode settings.
- Active management technology 8.0: The hardware and firmware base solution is powered by the system auxiliary power plane to remotely monitor.
- Network systems: Intel AMT(iAMT) stores hardware and software information in nonvolatile memory. Built-in management provides out-of-band management capabilities, allowing remote discovery and KVM to repair systems after OS failure detections or when a system has crashed. Alert and event logging features detect issues and quickly reduce downtime, pro-actively blocking incoming threats, containing infected clients before they impact the network, and operatively notifying the user when critical software agents are removed. For iAMT enable, refer AMT configuration. Schneider Electric provides a software tool called **System Monitor** used to enable the iAMT function. Refer to System Monitor *(see page 142)*.

System

- SATA hard disk drive interface: Six on-board SATA connectors:
  Two SATA III connectors with data transmission rates up to 600 MB/s and
  Four SATA II connectors with data transmission rates up to 300 MB/s
  With support the Schneider Electric host controller interface (AHCI) technology.
- System chipset: Intel® C216

Memory

RAM: Up to 32 GB in four 240-pin DIMM sockets that support dual-channel DDR3 ECC or Non-ECC 1066/1333/1600 SDRAM.

Input/Output

The Intel® C216 chipset provides:

- PCIe slot: 2 PCIe x16 expansion slots (x8 link) and 2 PCIe x4 expansion slots
- PCI bus: 3 PCI slots, 32-bit, 33 MHz PCI 2.2 compliant
- Enhanced parallel port: Configured to LPT1 or disabled. Standard DB-25 female connector cable is an optional accessory. LPT1 supports EPP/SPP/ECP.
- Serial port: Two serial ports. (COM1 is rear I/O, COM2 is on board connector)
- PS/2 keyboard and mouse connector: 2 x 6-pin mini-DIN connectors are located on the mounting bracket for easy connection to PS/2 keyboard and mouse.
- USB port: Supports up to 4 USB 3.0 ports with transmission rates up to 5 Gbps and 10 USB 2.0 ports with transmission rates up to 480 Mbps/s.
- LPC: 1 LPC connector to support Schneider Electric LPC modules, such as TPM module.
- GPIO: Rack iPC Performance supports 8-bit GPIO from super I/O for general-purpose control applications.

Graphics

- Integrated Intel HD graphics processor
- Display memory: 1 GB maximum shared memory when 2 GB or more of system memory is installed
- DVI-D: Resolution of 1920 x 1200 @ 60 Hz refresh rate (Only for QG2 version)
- CRT: Resolution of 2048 x 1536 @ 75 Hz refresh rate

Ethernet LAN

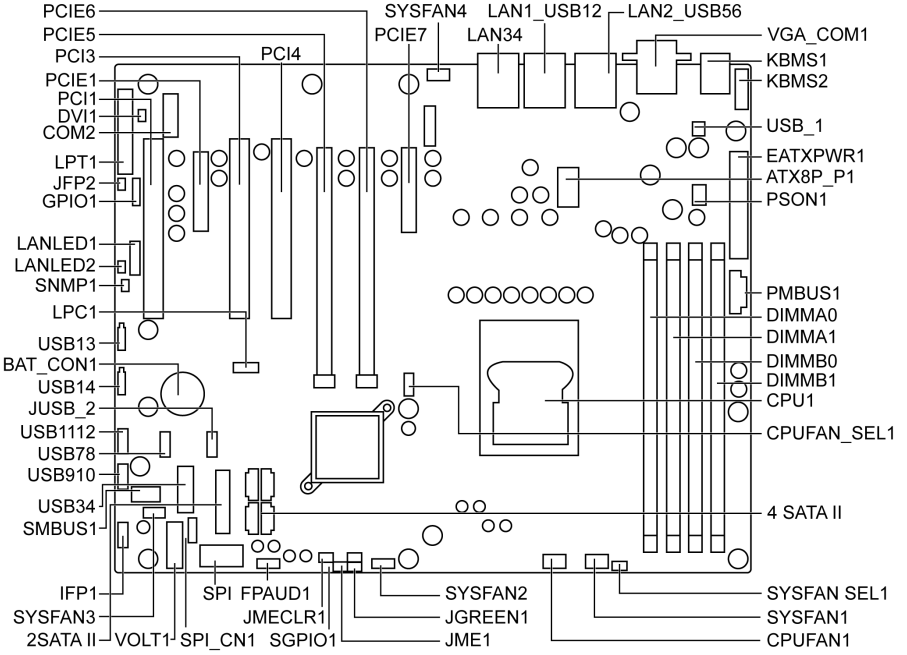
- Supports dual/four 10/100/1000 Mbps/s Ethernet ports via PCIe bus which provides a 300 MB/s data transmission rate.
- Interface: 10/100/1000 Mbps/s
- Controller: LAN1: Intel 82579LM; LAN2/3/4: Intel 82574 L (LAN 3/4 are for G4 SKU only).

Industrial Features

- Watchdog timer: Use to generate system reset or NC. The watchdog timer is programmable, with each unit equal to 1 second or 1 minute (255 levels).

Board Layout

The figure shows the board layout and jumper locations:



The table describes the Rack iPC Performance jumpers and their function:

Label	Function
JCMOS1	CMOS clear
JME1	Intel ME disable jumper for ME/BIOS update
JWDT1	Watch dog reset
JGREEN1	Deep sleep Sx mode
JUSB_1,JUSB_2	USB port and KBMS power source switch between +5 VSB and +5 V
CPUFAN_SEL1, SYSFAN_SEL1	FAN PWM(1-2)/DC mode selection(2-3)
PSON1	AT(1-2) / ATX(2-3)

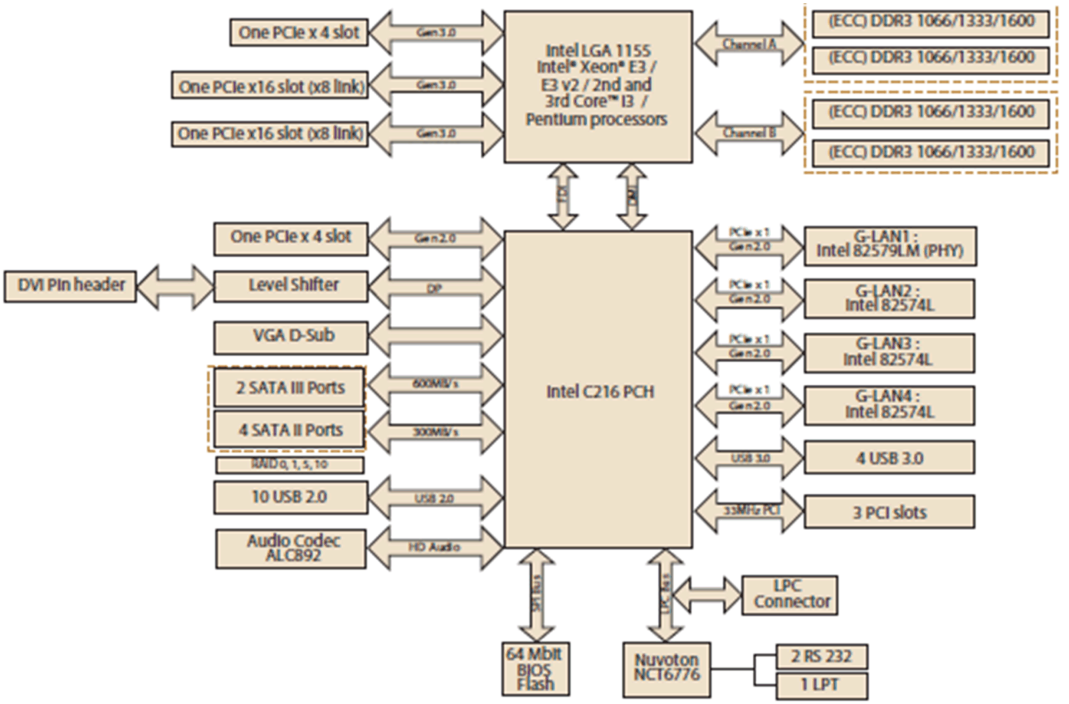
The table describes the Rack iPC Performance connectors and their function:

Label	Function
ATX24P_P1	ATX 24-pin main power connector (for system)
ATX8P_P1	Processor power connector (for CPU)
SATA0...1	SATA III (6 Gb/s)
SATA2...5	SATA II (3 Gb/s)
USB12	USB 3.0 port 1 2
USB34	USB 3.0 port 3 4 (Header)
USB56	USB 2.0 port 5 6
USB78, USB910, USB1112	USB 2.0 port 7,8,9,10,11,12 (Header)
USB13, USB14	USB 2.0 port 13, 14 (USB type A)
PCIE2, PCIE7	PCIE x4 slot
PCIE5, PCIE6	PCIe x16 slot (x8 link)
DIMMA0,DIMMA1,DIMMB0,DIMMB1	DDR3 slot
CPUFAN1	CPU FAN connector
SYSFAN1,SYSFAN2,SYSFAN 3,SYSFAN4	System FAN connector
LAN1_USB12,LAN2_USB56	LAN1 / USB 3.0 port 1, 2 stack connector LAN2 / USB 2.0 port 5, 6 stack connector
LAN34	LAN 3.4 stack connector
VGA_COM1	VGA+COM connector
KBMS1	PS/2 keyboard and mouse connector
KBMS2	External keyboard and mouse connector(6 pin)
SPI1	SPI socket
SPI_CN1	SPI flash card pin header
LANLED1,LANLED2	LAN LED extension connector
SMBUS1	SM bus From PCH
SNMP1	SM bus from HW monitor IC
GPIO1	GPIO header
FPAUD1	Audio front panel header
LPT1	Parallel port
COM2	Serial port: RS-232
JFP1	Front panel header
LPC1	Low pin count connector for Schneider Electric TPM LPC modules
LANLED1	LAN1/2 LED extension connector
LANLED2	LAN3/4 LED extension connector

Label	Function
VOLT1	Voltage display
PMBUS1	PMBUS connector to communicate with power supply

Block Diagram

The figure shows the block diagram of Performance motherboard:



Interface Connections of the Rack iPC Performance

Introduction

⚠ WARNING

EQUIPMENT DISCONNECTION OR UNINTENDED EQUIPMENT OPERATION

- Ensure that power, communication, and accessory connections do not place excessive stress on the ports. Consider the vibration in the environment.
- Securely attach power, communication, and external accessory cables to the panel or cabinet.
- Use only D-Sub 9-pin connector cables with a locking system in good condition.
- Use only commercially available USB cables.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Parallel Port (LPT1)

The parallel port is normally used to connect the motherboard to a printer. The Rack iPC Performance includes an on board parallel port, accessed through a 25-pin flat-cable connector, LPT1.

USB Ports (USB12, USB56, USB34, USB78, USB910, USB1112, USB13, USB14)

Rack iPC Performance provides up 14 x USB ports. USB5...14 are USB 2.0 ports supporting transmission rates up to 480 MB/s. USB1...4 are USB 3.0 ports supporting transmission rate up to 5 Gbps.These ports support plug & play and hot swapping for up to 127 external devices and are able to be disabled in BIOS menu. If all USB ports are used, switch the USB power to 5 V instead of five VSB.

LAN Ports (LAN1, LAN2)

The Rack iPC Performance is equipped with 2 or 4 high-performance 1000 Mbit/s Ethernet LANs. They are supported by all major network operating systems. The RJ45 jacks on the rear plate provide convenient 1000 Mbit/s operation.

LAN LED indicator

LAN mode	LAN indicator
1 Gbps link on	LED1 green on (left)
100 Mbit/s link on	LED1 orange on (left)
10 Mbit/s link on	LED1 N/A (left)
Active	LED2 Green flash (right)

USB Power Switch

The Rack iPC allows the user to set USB and KBMS power between 5 VSB and 5 V. When the jumper is set to 5 V, the board does not support S3/S4.

VGA Connector (VGA1)

The Rack iPC provides a high-resolution VGA interface connected by an SUB-D15 connector to support a VGA CRT monitor for display resolutions of up to 1900 x 1200.

Serial Ports (COM1, COM2)

This interface is used to connect Rack iPC to remote equipment, via a cable.

By using a long PLC cable to connect to the Rack iPC, it is possible that the cable can be at a different electrical potential than the panel, even if both are connected to ground.

The Rack iPC serial port is not isolated. The SG (signal ground) and the functional ground (FE) terminals are connected inside the panel.

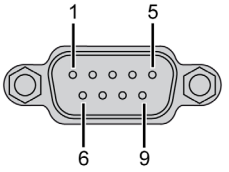
⚠⚠ DANGER

ELECTRIC SHOCK

- Make a direct connection between the ground connection screw and ground.
- Do not connect other devices to ground through the ground connection screw of this device.
- Install all cables according to local codes and requirements. If local codes do not require grounding, follow a reliable guide such as the US national electrical code, article 800.

Failure to follow these instructions will result in death or serious injury.

The table shows the SUB-D9 pin assignments:

Pin	Assignment	
	RS-232	
1	DCD	SUB-D9 male connector:
2	RXD	
3	TXD	
4	DTR	
5	GND	
6	DSR	
7	RTS	
8	CTS	
9	RI	

NOTE: Any excessive weight or stress on communication cables may disconnect the equipment.

The Rack iPC offers 2 serial ports (one on the rear panel and one onboard).These ports can connect to a serial mouse, printer, or communications network. The IRQ and address ranges for those ports are fixed. However, if you want to disable the port or change these parameters later, you can do this in the system BIOS setup. Different devices implement the RS-232 standards in different ways. If you are having issues with a serial device, be sure to check the pin assignments for the connector.

PS/2 Keyboard and Mouse Connector (KBMS1)

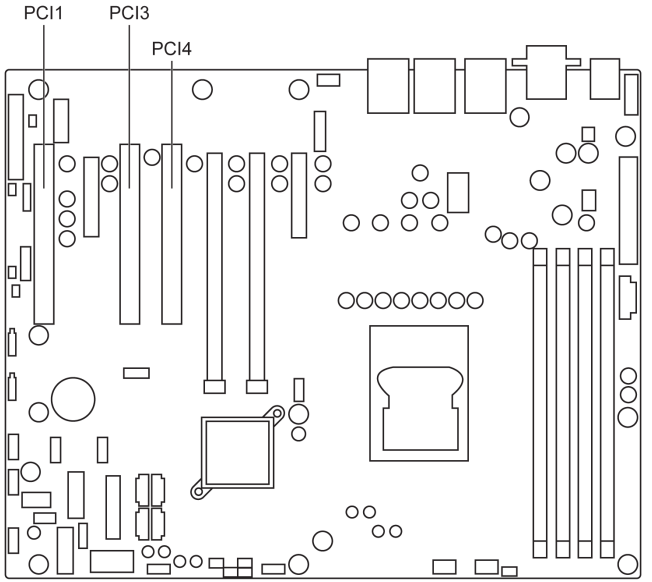
Two 6-pin mini-DIN connectors on the rear panel of the motherboard provide PS/2 keyboard and mouse connections.

Serial ATA Interface (SATA0...5)

The Rack iPC features 2 high performance serial ATA III interfaces (up to 600 MB/s, blue connector) and 4 serial ATA II interfaces (up to 300 MB/s, black connector).

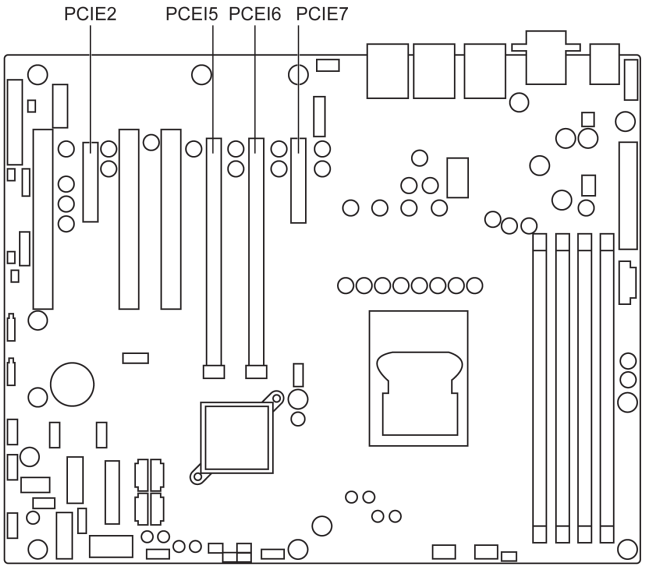
PCI Slots (PCI1, PCI3, PCI4)

The Rack iPC Performance provides three 32-bit / 33 MHz PCI slots.



PCIe Slots Expansion Slot (PCIE2, PCIE5, PCIE6, PCIE7)

The Rack iPC Performance provides 2 PCIe x16 slots (x8 link) and 2 PCIe x4 slots for users to install add-on VGA cards. When their applications require higher graphics performance than the embedded graphics controller CPU can provide, or high bandwidth demanded I/O card, such as frame grabber card, raid card, and 10 G LAN card.



Auxiliary 8-Pin Power Connector (ATX8P_P1)

The ATX8P_P1 is an 8-pin connector. For a fully configured system, use a power supply unit (PSU) that complies with ATX 12 V specification 2.0 (or later version). Do not forget to connect the 8-pin EATX12 V power plug; otherwise, the system does not restart.

Mounting Jumpers of the Rack iPC Performance

Overview

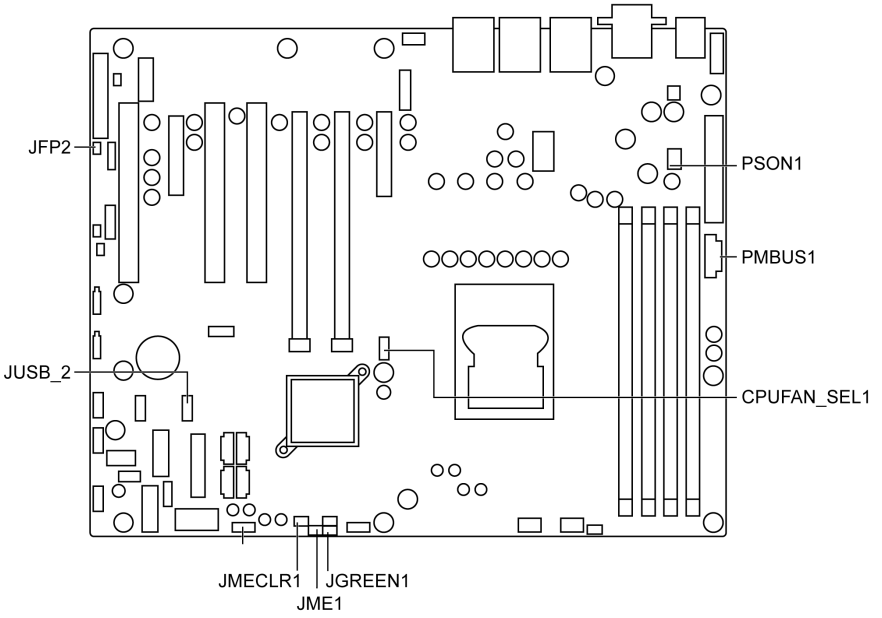
You may configure the Rack iPC Performance to match the needs of your application by setting jumpers.

NOTE: A pair of needle-nose pliers may be helpful when working with jumpers.

Jumpers and Connectors

Connectors on the Rack iPC Performance motherboard link it to external devices such as hard disk drives and a keyboard. In addition, the board has a number of jumpers that are used to configure your system for your application. The tables below list the function of each of the jumpers and connectors. Later sections in this chapter give instructions on setting jumpers.

The table describes the Rack iPC Performance jumpers and connectors:



The table describes the Rack iPC Performance jumpers and their function:

Label	Function
JCMOS1	CMOS clear
JME1	Intel ME disable jumper for ME/BIOS update
JWDT1	Watch dog reset

Label	Function
JGREEN1	Deep sleep Sx mode
JUSB_1,JUSB_2	USB port and KBMS power source switch between +5 VSB and +5 V
CPUFAN_SEL1, SYSFAN_SEL1	FAN PWM(1-2)/DC mode selection(2-3)
PSON1	AT(1-2) / ATX(2-3)

Setting Up Jumpers

You can configure your motherboard to match the needs of your application by setting the jumpers. A jumper is a metal bridge that closes an electrical circuit. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To “close” (or turn on) a jumper, you connect the pins with the clip. To “open” (or turn off) a jumper, you remove the clip. Sometimes a jumper consists of a set of 3 pins, labeled 1, 2, and 3. In this case, you connect either pins 1 and 2, or 2 and 3. A pair of needle-nose pliers may be useful when setting jumpers.

CMOS and ME Clear

The Rack iPC motherboard contains a jumper that can erase CMOS data and reset the system BIOS information. Normally this jumper should be set with pins 1-2 closed. If you want to reset the CMOS data, set JCMOS1 to 2-3 closed for just a few seconds, and then move the jumper back to 1-2 closed. This procedure resets the CMOS to its default setting.

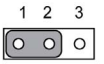
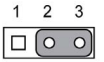
The table describes the CMOS data:

Function	Jumper setting
Keep CMOS data (default setting)	
Clear CMOS data	

ME Update

The Rack iPC contains a jumper that can update for ME firmware. Generally this jumper should be set with pin 1-2 closed. If you want to update ME firmware, set JME1 to 2-3 closed for new ME firmware update.

The table describes the ME update:

Function	Jumper setting
Lock ME update (default setting)	
ME update	

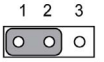
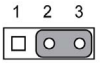
Case Open Sensor

The Rack iPC motherboard contains a jumper that provides a chassis open sensor. The buzzer on the motherboard beeps when the case is opened.

Watchdog Timer Output

The Rack iPC contains a watchdog timer that resets the CPU. This feature means the Rack iPC Performance recovers from a software failure detection or an EMI issue. The JWDT1 jumper settings control the outcome of what the computer does in the event the watchdog timer is tripped.

The table describes the ME update:

Function	Jumper setting
Reset (default setting)	
DC	

Deep Sx Mode

The Rack iPC contains a jumper that can support energy saving for BIOS deep Sx feature. Normally this jumper should be set with pin 1-2 closed. If you want to disable, set JGREEN1 to 2-3 closed for disable.

The table describes the Deep Sx mode:

Function	Jumper setting
Enable (default setting)	
Disable	

USB Power Switch

The Rack iPC contains a jumper that can support USB/KBMS power source from 5 Vsb or 5 V. The default setting is 1-2 closed which is supporting USB stand-by power under S5. When the jumper is 2-3 closed, the USB/KBMS power source is switched to 5 V. If you want to disable USB stand-by power under S5, and under 2-3 closed, it does not support S3 and S4 mode.

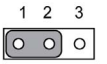
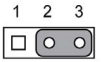
The table describes the USB power switch:

Function	Jumper setting
+5 Vsb (default setting)	
+5 V	

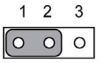
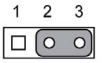
CPU,SYSTEM Fan PWM/DC Mode Selection

The Rack iPC contains a jumper that can support PWM or DC mode, normally this jumper should be set with pin 1-2 closed. If you want to change to DC mode, set CPUFAN_SEL1, SYSFAN_SEL1 to 2-3 closed for disable.

The table describes the PWM/DC mode selection:

Function	Jumper setting
PWM mode (default setting)	
DC mode	

The table describes the ATX/AT mode selector:

Function	Jumper setting
AT mode	
ATX mode (default setting)	

PCI Bus Routing Table

AD PCI slot INT	PCI1	PCI3	PCI4
	AD16	AD21	AD22
A	A	F	G
B	B	G	H
C	C	H	E
D	D	E	F

Mounting Jumper Clips

The steps describe the mounting of jumper of the Rack iPC Performance:

Step	Action
1	Remove the power.
2	Insert the jumper.

Jumper Setting

The table describes the setting for the LVDS power setting:

CN17	LVDS power
Setting	Function
1-3 2-4	VDD_DSUB (pin 7 and pin 20) of LVDS pin is 5 Vdc
3-5 4-6	VDD_DSUB (pin 7 and pin 20) of LVDS pin is 3.3 Vdc

The table describes the setting for the clear CMOS setting:

CN3	Clear CMOS
Setting	Function
–	Normal (default setting)
1-2	Clear CMOS

Index

R

S

U

V