

Intel[®] RAID Portable Cache Module AXXRPCM3 User's Guide

Order Number: E21065-001



Warranty Notice: Adding a battery on an Intel RAID controller will limit the warranty of this product. Returns determined to be caused by battery installation damage, stripped screws, or other damage resulting from the battery installation will not be covered. ESD damage to the board will also not be covered by the warranty.

The warranty on the AXXRPCM3 is 1 year.

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Contents

Important Safety Instructions..... 4

About the Intel® RAID Portable Cache Module (Battery)..... 5

Installing the Intel® RAID Portable Cache Module AXXRPCM3..... 7

Monitoring Battery Backup 9

Intel® RAID Portable Cache Module AXXRPCM3 Specifications 11

Figures

Figure 2-1: Front and Back Views of the AXXRPCM3..... 7

Figure 2-2: Portable Cache Module installed into the DIMM slot..... 8

Figure 3-1: Battery monitoring with the RAID BIOS Utility..... 9

Figure 3-2: Battery information in Intel® RAID Web Console 2..... 10

Important Safety Instructions

Important Safety Instructions

Read all caution and safety statements in this document before performing any of the instructions. See *Intel Server Boards and Server Chassis Safety Information* at <http://support.intel.com/support/motherboards/server/sb/cs-010770.htm>.

Wichtige Sicherheitshinweise

Lesen Sie zunächst sämtliche Warn- und Sicherheitshinweise in diesem Dokument, bevor Sie eine der Anweisungen ausführen. Beachten Sie hierzu auch die Sicherheitshinweise zu Intel-Serverplatinen und -Servergehäusen unter <http://support.intel.com/support/motherboards/server/sb/cs-010770.htm>.

重要安全指导

在执行任何指令之前，请阅读本文档中的所有注意事项及安全声明。和/或 <http://support.intel.com/support/motherboards/server/sb/cs-010770.htm> 上的 *Intel Server Boards and Server Chassis Safety Information*（《Intel 服务器主板与服务器机箱安全信息》）。

Important Safety Instructions Consignes de sécurité

Lisez attention toutes les consignes de sécurité et les mises en garde indiquées dans ce document avant de suivre toute instruction. Consultez *Intel Server Boards and Server Chassis Safety Information* rendez-vous sur le site <http://support.intel.com/support/motherboards/server/sb/cs-010770.htm>.

Instrucciones de seguridad importantes

Lea todas las declaraciones de seguridad y precaución de este documento antes de realizar cualquiera de las instrucciones. Vea *Intel Server Boards and Server Chassis Safety Information* en <http://support.intel.com/support/motherboards/server/sb/cs-010770.htm>.

WARNINGS

Server power on/off: The push-button on/off power switch on the front panel of the server does not turn off the AC power. To remove AC power from the server, you must unplug the AC power cord from either the power supply or wall outlet.

- Hazardous conditions—power supply: Hazardous voltage, current, and energy levels are present inside the power supply enclosure. There are no user-serviceable parts inside it; servicing should only be done by technically qualified personnel.

About the Intel® RAID Portable Cache Module (Battery)

Intel® RAID Controllers and Intel® Integrated Server RAID Modules provide reliability, high performance, and fault-tolerant disk subsystem management. A complete fault-tolerant strategy requires protection for all data, including the unwritten cached data in the RAM cache. If power is lost, the data in RAM is lost. To avoid this data loss, a battery can be added to supply power to the RAID RAM during an AC power outage or if the AC power cord is removed.

A battery backup unit protects the integrity of the cached data on Intel RAID controllers by providing backup power if there is a complete AC power failure or a brief power outage. Intel provides two types of battery modules – the RAID Portable Cache Modules (RPCMs) which include RAM and the RAID Smart Battery Back-up Units (RSBBUs). The Intel RPCMs and RSBBUs provide an inexpensive alternative to using an uninterruptible power supply (UPS) or act as a second level of fault tolerance when used in conjunction with a UPS.

The cache memory available on Intel controllers can improve overall system performance. Writing data to the controller's cache memory is much faster than writing it to a storage device. Write operations appear to complete very quickly at the software application level. The Intel RAID controller then writes the cached data to the storage device when system activity is low or when the cache is getting full. The risk of using write-back cache is that the cached data can be lost if the AC power fails before it has been written to the storage device. This risk factor is eliminated when the Intel RAID controller has an onboard battery backup.

The Intel RPCMs monitor the voltage level of the DRAM modules installed on the Intel RAID controller. If the voltage drops below a predefined level, the battery backup module switches the memory power source from the Intel RAID controller to the battery cache module. As long as the voltage level stays below the predefined value, the Intel RPCM provides power for memory. If the voltage level returns to an acceptable level, the RPCM switches the power source back to the Intel RAID controller, and all pending writes to storage devices are completed with no data loss.

A RAID portable cache module (PCM) has built-in functionality to charge the battery cache module automatically and to communicate battery status information such as voltage, temperature, and current to the host computer system. Battery charging and recharging take place automatically.

The AXXRPCM3, which features NiMH battery cell technology, mounts directly into the DIMM slot of the Intel® RAID Controller SRCSASJV (but not the Intel® RAID Controllers SROMB18E nor SRCSAS18E).

Replacing Battery Backup Units

Intel recommends that you replace batteries once a year or after 500 recharging cycles, whichever comes first. The warranty on the battery cache module is for one year. After you install a new battery, use one of the Intel configuration utilities to reset the battery recharge cycle counter to zero.

Disposing of Battery Backup Units

o **WARNING:** Do not damage the battery cache module in any way. Toxic chemicals can be released if it is damaged.

The material in the battery cache module contains heavy metals that can contaminate the environment. Federal, state, and local regulations prohibit the disposal of rechargeable batteries in public landfills. Be sure to recycle the old battery properly. Intel reminds you that you must comply with all applicable battery disposal and hazardous material handling laws and regulations in the country or other jurisdiction where you are using the battery.

Installing the Intel® RAID Portable Cache Module AXXRPCM3

Figure 2.1 displays the front and back views of the Intel® RAID Portable Cache Module AXXRPCM3. The battery is mounted on a mini-DIMM which fits into the mini DIMM slot on the Intel® RAID controller SRCASJV.

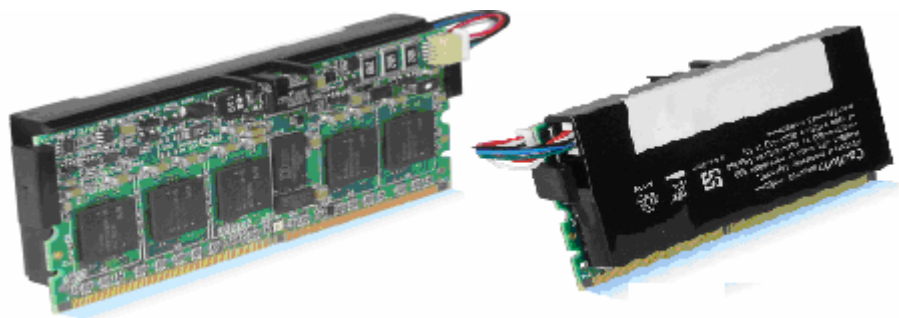


Figure 2-1: Front and Back Views of the AXXRPCM3

Important Pre-installation Considerations

Warning: Always ground yourself and/or use a ground strap before touching the RAID controller or the RPCM. Perform all installation work at an ESD-safe workstation.

The batteries in the RPCM3 must recharge for at least six hours during fast charge under normal operating conditions.

To protect your data, Intel recommends that you set the RAID controller Write Policy to write-through until the battery unit is fully charged. When the battery unit is charged, you can change the Write Policy to write-back to take advantage of the performance improvements of data caching.

The maximum ambient temperature for the battery is 45°C. Note: The temperature of the battery cache module is generally 15–20 degrees higher than the ambient temperature during fast charge. Therefore, to complete the fast charge cycle, ambient temperature should be less than 45°C. If the ambient temperature exceeds 45°C, the fast charge cycle will terminate prematurely, thus preventing the battery from reaching a fully charged state.

Step-by-step AXXRPCM3 Installation

Follow the steps in this section to install the AXXRPCM3 on the Intel® RAID Controller SRCASJV.

A. If the RAID controller is already installed in a computer, follow these steps to remove it before you install the AXXRPCM3:

1. Shut down the computer, turn off the power, and unplug the power cord(s).

2. Remove the cover from the computer and ground yourself before touching the RAID controller. Carefully unplug all cables going to the RAID controller. On the data cables, depress the silver spring at the connector end to make sure the 2 tiny catches release.
3. Following the instructions in the User's Guide for your server, carefully remove the RAID controller from its slot.
4. Place the RAID controller on a flat, clean, static-free surface and remove the RAM from the DIMM slot by opening each of the white side clasps.

B. Follow these steps to install the AXXRPCM3 on the RAID Controller.

1. Ground yourself, and remove the AXXRPCM3 from the packing.
2. Place the module into the mini-DIMM slot with the black casing towards you and the RAM side towards the Controller card.
3. Lock the two white latches (one per side) around the notches in the cache module to secure the module.



Figure 2-2: Portable Cache Module installed into the DIMM slot

C. Place the Intel® RAID Controller back into the server

1. Align the RAID controller with the PCI-Express slot and press down gently, but firmly, to ensure that the RAID controller is properly seated in the slot.
2. Attach the cables, as needed, to the connectors on the Intel RAID controller.
3. Replace the computer cover and reattach the power cord(s).

Monitoring Battery Backup

Multiple utilities are available to display and configure battery information including recharge count. When you replace a battery, you should reset this counter to zero. Intel recommends that you replace the battery once per year or after 500 recharge cycles, whichever comes first.

Note: This chapter describes only the battery-related features of the Intel utility programs. For complete information on these utilities, see the Intel RAID Software User's Guide.

Monitoring RAID Batteries with the RAID BIOS Utility

The RAID BIOS Configuration Utility configures disk arrays and logical drives. It is independent of the operating system and accessed at server start up by pressing <Ctrl> <G>

To view the battery information, follow these steps:

1. At boot, press <Ctrl><G> when prompted.
2. In the RAID BIOS Console, choose "Adapter Properties" on the main menu.
3. Click Next to view the second Adapter Properties screen.
4. In the battery backup field at the top left of the screen, click the word "Present".

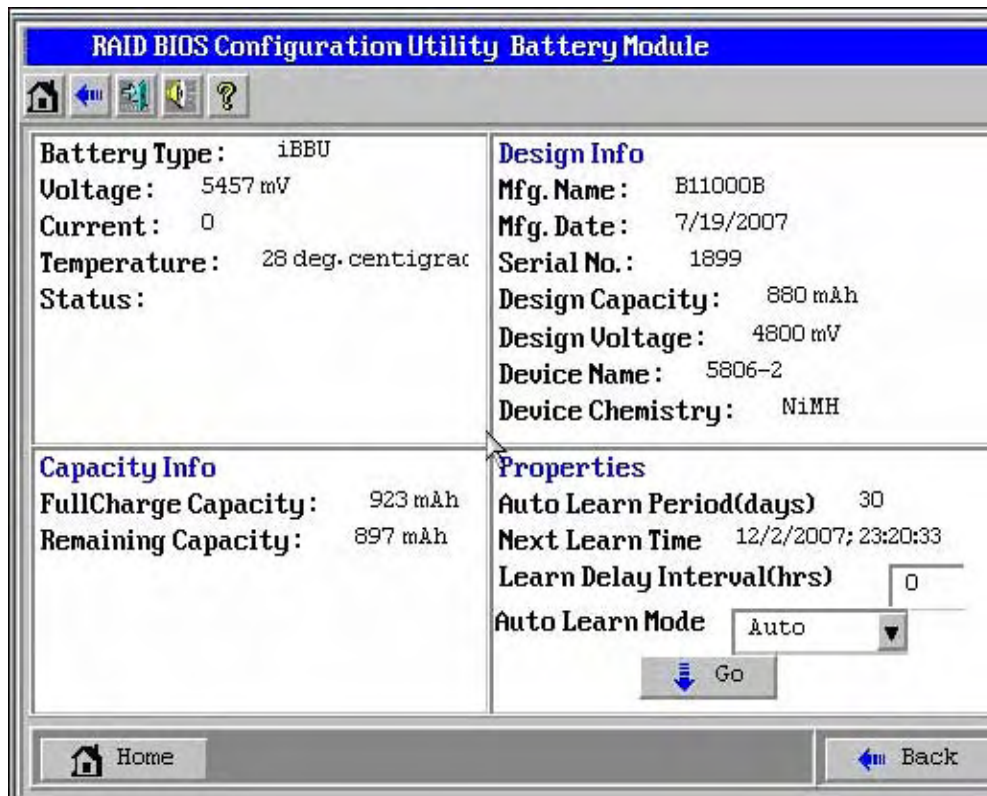


Figure 3-1: Battery monitoring with the RAID BIOS Utility

Most of the battery module properties are view-only. In the lower right panel of the RAID BIOS Console there are two properties that can be changed. (Intel recommends that you leave these properties at their default settings.)

- Learn Delay Interval – default 30 days
- Auto Learn Mode – default Auto

Note: The learning cycle is a battery calibration operation performed by the controller periodically to determine the condition of the battery.

Monitoring RAID Batteries with the Intel® RAID Web Console 2

The status of all batteries connected to controllers in the server is visible in Intel® RAID Web Console 2 by selecting the Physical tab in the left panel. To see the battery, select the Controller. The portable cache module will appear as the last item on the list under that controller. An icon will appear in the left pane to indicate the battery status. The rectangle indicates normal operation; the red dot indicates the battery has failed.

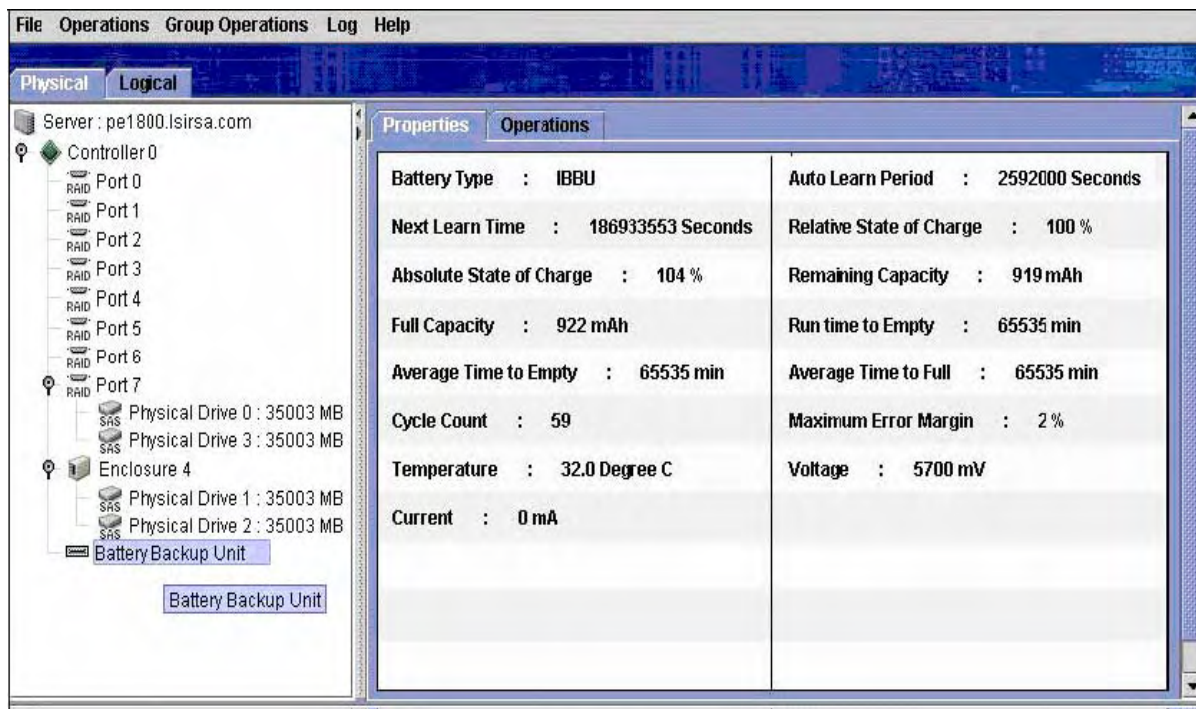


Figure 3-2: Battery information in Intel® RAID Web Console 2

The battery properties include the following:

- The number of times the battery has been recharged (Cycle Count) and the full capacity
- The percentage of its current state of charge and the estimated time until it will be depleted
- The current battery temperature, voltage, current, and remaining capacity
- The estimated time until the battery is fully charged (only if the battery is charging)

Intel® RAID Portable Cache Module AXXRPCM3 Specifications

AXXRPCM3 Specifications:

Technology	LION - Lithium Polymer
Operating Environment:	10–45°C ambient temperature 20% to 80% humidity non-condensing
Storage Temperature:	Depends on storage time:< 30 days: 0–50 °C 30–90 days: 0–40 °C ; > 90 days: 0–30 °C
Fast Charge Rate:	500maH
Voltage:	OCV: 3.7 V
Mechanical:	3.4” x 1.8”
Capacity:	1350maH
Charge Time:	Typical: ~6 hours to charge from 3.6V OCV to 4.2 V OCV Completely depleted: 8 hours
Maximum Retention Time:	72 hours
Shelf Life:	1 year
Operational Life:	1 year warranty on the AXXRPCM3. 500 recharge cycles.
Included Cache Memory:	256 Mbytes, DDR2 667MHz (1.8V),
MTBF (Electrical Components):	1,187,012 hours at 40° C
Smart Battery Monitoring:	Temp monitoring via I2C interface. Supports v1.1 “Smart battery System Manager”

The Intel utilities display a counter showing the number of times a battery has been recharged. When you replace a battery, you should run the utility program and reset this counter to zero for the new battery. Intel recommends that you replace the battery cache module once a year or after 500 recharging cycles, whichever comes first. The warranty on the battery cache module is for one year.