

# **AC4G**

## **User's Manual**

The world's first thermoelectric cooler for PC processors

[www.activecool.com](http://www.activecool.com)



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### Compliance

This equipment has been tested and found to comply with the Class B digital device, under **FCC**, **CE**, and **VCCI** rules. These rules are designed to ensure reasonable protection against harmful interference in a residential installation.

Modifications made to this device not expressly approved by Active Cool Ltd. could void the user's authority to operate the equipment.

### Safety warning



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Active Cool AC4G has **no user-serviceable parts** and contains potentially hazardous voltages. To prevent risk of electric shock, do not open the unit under any circumstances. Do not attempt to power the AC4G from any source other than a grounded electric outlet protected by a fuse or circuit breaker.

**Not for use in life-support systems.**

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## Package Contents

1. User's Manual & Quick Start
2. AC4G PCI card
3. AC4G Cooling Unit (for either AMD or Intel)
4. 2 heat sink clips (Intel cooling unit only)
5. Power cord
6. Silicone compound (small sachet)

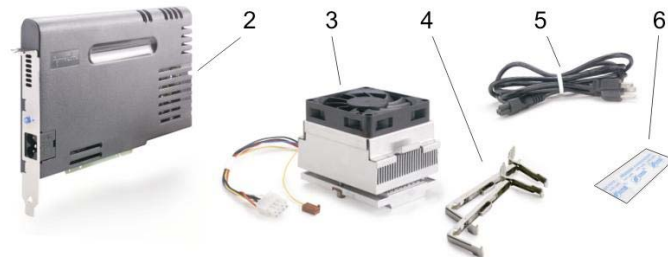


Figure 1. Package contents

## Installation

### Preparation

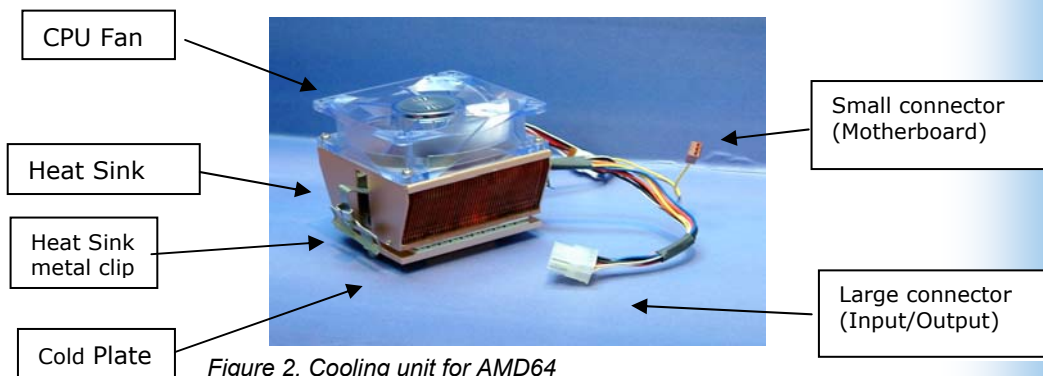
1. Shut down the computer, and disconnect it from the mains electricity supply.
2. Leave the computer to cool down, and then remove the existing CPU heat sink.



**Warning:** If the computer has been in use the CPU area may be very hot. Do not touch any parts until you are sure they have cooled down.

### Cooling unit installation

Figure 2 shows the AC4G Cooling Unit for AMD64. Figure 3 shows the AMD unit heat sink clip.



- 3 Apply a thin layer of silicone compound (from the small sachet) to the bottom of the cold plate.
4. Position the AC4G cooling unit on the CPU so that the cold plate sits squarely over the CPU.

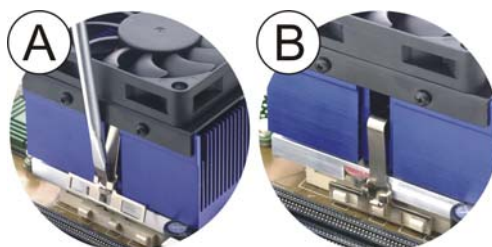


Figure 3. AMD unit heat sink clip: being secured (A); secured (B)

5. Use the heat sink clip (AMD) or clips (Intel) to clamp the cooling unit securely to the retention mechanism on the motherboard.

### PCI card installation

1. Place the AC4G PCI card in any free PCI slot.

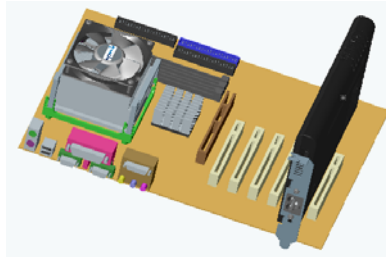


Figure 3. PCI card inserted into a PCI slot

2. Connect the small connector to the CPU fan connector on the motherboard.
3. Connect the large connector to the input/output connector on the back of the AC4G PCI card (see Figure 7).

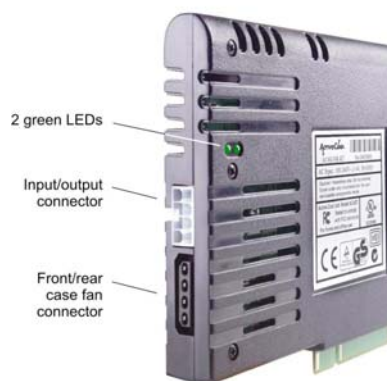


Figure 4. AC4G PCI card – rear view

4. Disconnect the front and rear case fans from the PC power supply. Connect the front and rear fans to each other, and then connect them to the front/rear case fan connector on the back of the AC4G PCI card.
5. Verify that the CPU fan and all case fans are unobstructed.
6. Connect the supplied power cable to the power plug on the bracket of the AC4G PCI card, and connect the other end to the electric mains (100–240V).



Figure 5. AC4G PCI card – bracket-side

7. Connect the PC to the electric mains.
8. Power up the PC.
9. Verify that the all three LEDs on the AC4G PCI card are lit.
10. Put the PC cover back on.

Installation is complete.

## Operation

In order for any cooling system to work efficiently there must be free air flow around the PC case. The PC should not be enclosed in a cabinet, and there should be at least 10cm between the back of the PC and the wall or furniture.

1. Connect the PC to the electric mains.
2. Connect the power plug on the bracket of the AC4G PCI card to the electric mains (100–240V).

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**Note:** Once AC4G is installed, the computer itself will not operate unless the AC4G is connected to the electrical mains.

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3. Power up the PC.

As the PC powers up, the blue PCI card LED (at the back of the computer) blinks five times, and then remains alight, indicating that AC4G is functioning properly.

## Cooling modes

The AC4G gives you cooling and noise reduction in a single system. It can be run in either of two modes: **Extra-quiet** mode (default) or **Extra-cool** mode (see Figure 7, page 8).

In **Extra-quiet mode**, as the graph illustrates, AC4G control allows a small temperature increase ( $\Delta T$ ) before turning the fans on. This minimizes fan noise, while maintaining a significant cooling advantage over conventional coolers.

In **Extra-cool mode**, cooling begins whenever CPU temperature begins to rise. The result is an extra-cool CPU, with mildly increased fan noise.

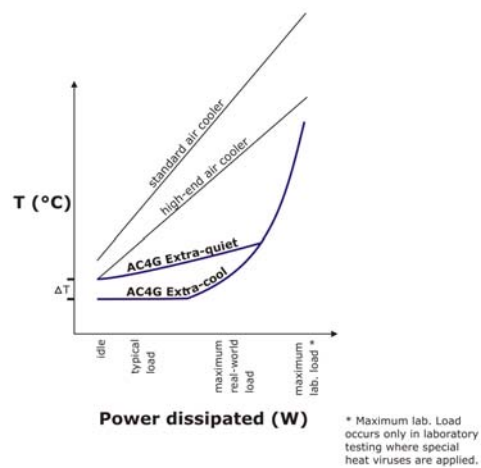


Figure 6. AC4G Cooling Modes

## Switching between modes

The cooling mode for the system is determined by a removable jumper in the power and control unit (see Figure 7, page 8). To switch between modes either remove or replace the jumper.

- **Jumper inserted** (default) - the system is in **Extra-quiet** mode.
- **Jumper removed** - the system is in **Extra-cool** mode.



**Warning:** Disconnect the computer and the AC4G unit from the power source before removing or inserting the jumper.



Figure 7. Location of the removable circuit jumper on PCI card

## Troubleshooting

The blue LED on the bracket-side of the AC4G PCI card, next to the AC power connector (see Figure 5 page 6) indicates that the AC4G system is functioning properly. During normal operation the blue LED is on continuously. During power up from quiet mode to high-power cooling the LED blinks five times.

### Reading AC4G LEDs

In addition to the blue LED that is visible at the back of the PC (see Figure 5, page 6), two green LEDs are located to the rear of the PCI card (see Figure 4, page 5) and are visible only when the cover is removed. Together these three LEDs indicate AC4C status, and can help in troubleshooting.



*Table 1: LED status summary*

<b>LED</b>	<b>State</b>	<b>Meaning</b>
Blue	ON continuously	Normal operation. All systems OK.
	Blinks 5 times	Transition from quiet mode to high-power cooling.
	OFF	No AC current.
	Constant blinking	CPU fan stalled. (If the CPU fan stalls blinking of the LEDs is preceded by a screen warning.)
Green (inner)	ON	Receiving 5V through PCI connector.
	OFF	Not receiving 5V through PCI connector.
Green (outer)	ON	Receiving 12V through PCI connector.
	OFF	Not receiving 12V through PCI connector.
	Blinking	Short or overload in one of the fans.

## Troubleshooting suggestions

*Table 2: Troubleshooting suggestions*

<b>Problem</b>	<b>LED status</b>	<b>Possible cause</b>	<b>Action</b>
PC does not power up or resets continuously.	Blue LED permanently OFF.	No power to AC4G PCI card.	Check power cord from AC4G PCI card bracket to electrical mains.
		No power to PC	Check power cord from computer to mains.
Screen alert appears, then screen blanks out.	Blue LED blinking.	CPU fan stalled.	Make sure CPU fan is working properly (it may be jammed by a physical obstruction or disconnected from the power source).
Active Monitor on computer screen indicates that CPU fan is not working.		Connector from Cooling Unit to motherboard not properly connected.	Make sure connector from Cooling Unit to motherboard is connected properly to the CPU fan connector on the motherboard.



Problem	LED status	Possible cause	Action
	Blue and Green LEDs blinking.	Overload from case fans.	In the unlikely event of the case fans drawing more than 1 Amp, disconnect one or more case fans from the installation (and run them directly from their designated power supply).
	One or both green LEDs not lit.	PCI card not connected properly to PCI slot.	Remove AC4G PCI card and set it in the PCI slot again.