



Powerline Internet Audio Video Kit

Connect HDTVs & Other Internet-Ready Devices



HP500AV Powerline Internet Audio Video Kit Installation Manual

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1. IMPORTANT INFORMATION

1.1 Important Safety Notes

This product is intended for connection to the AC power line. For installation instructions, refer to the Installation section. The following precautions should be taken when using this product.

- Please read all instructions before installing and operating this product.
- Please keep all instructions for later reference.
- Please follow all warnings and instructions marked on the product.
- **For safety reason, when device is being powered on, DO NOT be installed in any electric socket which makes the surface with venting holes on the product to face downward (facing the floor).**
- **Unplug the Powerline device from the wall outlet before cleaning. Use a dry cloth for cleaning. DO NOT use liquid cleaners or aerosol cleaners.**
- **DO NOT** operate this product near water.
- This product should **never** be placed near or over a radiator, or heat register.
- This product relies on the building's electrical installation for short-circuit (over current) protection.
- **DO NOT** allow anything to rest on the product interconnect plug. **DO NOT** locate this product where people may walk on the cords and wires.
- Because this product sends data over the power line, it is recommended that you plug directly into a power outlet. Do not plug the device into a UPS or power strip with surge protection. The product has its own power filter for protection against surges.
- **Only** a qualified technician should service this product. Opening or removing covers may result in exposure to dangerous voltage points or other risks.
- Unplug the product from the wall outlet and refer the product to qualified service personnel for the following conditions:
 - When the interconnect cords are damaged or frayed.
 - If liquid has been spilled into the product.
 - If the product has been exposed to rain or water.
 - If the product does not operate normally when the operating instructions are followed.
 - If the product exhibits a distinct change in performance.

1.2 Federal Communications Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

-Reorient or relocate the receiving antenna.

-Increase the separation between the equipment and receiver.

-Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

-Consult the dealer or an experienced radio/ TV technician for help.

CAUTION:

Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment.

Labeling Requirements

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

RF Exposure Warning

This equipment must be installed and operated in accordance with provided instructions and the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter. End-users and installers must be provide with antenna installation instructions and transmitter operating conditions for satisfying RF exposure compliance.

Canada, Industry Canada (IC) Notices

This Class B digital apparatus complies with Canadian ICES-003 and RSS-210.

Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Radio Frequency (RF) Exposure Information

The radiated output power of the Wireless Device is below the Industry Canada (IC) radio frequency exposure limits. The Wireless Device should be used in such a manner such that the potential for human contact during normal operation is minimized.

This device has also been evaluated and shown compliant with the IC RF Exposure limits under mobile exposure conditions. (antennas are greater than 20cm from a person's body).

Canada, avis d'Industry Canada (IC)

Cet appareil numérique de classe B est conforme aux normes canadiennes ICES-003 et RSS-210. Son fonctionnement est soumis aux deux conditions suivantes : (1) cet appareil ne doit pas causer d'interférence et (2) cet appareil doit accepter toute interférence, notamment les interférences qui peuvent affecter son fonctionnement.

Informations concernant l'exposition aux fréquences radio (RF)

La puissance de sortie émise par l'appareil de sans fil est inférieure à la limite d'exposition aux fréquences radio d'Industry Canada (IC). Utilisez l'appareil de sans fil de façon à minimiser les contacts humains lors du fonctionnement normal.

Ce périphérique a également été évalué et démontré conforme aux limites d'exposition aux RF d'IC dans des conditions d'exposition à des appareils mobiles (les antennes se situent à moins de 20 cm du corps d'une personne).

2. INTRODUCTION

The **Powerline Ethernet Adapters** take advantage of your home's existing electrical wiring to build high speed network connection for surfing website, video streaming, online gaming or any bandwidth applications. Simply plug them to AC outlet and instantly establish powerline network. It means there is no IP configuration or additional wires required.

2.1 Package contents

Two PLC devices

Two Ethernet Cables






2.2 Product Overview

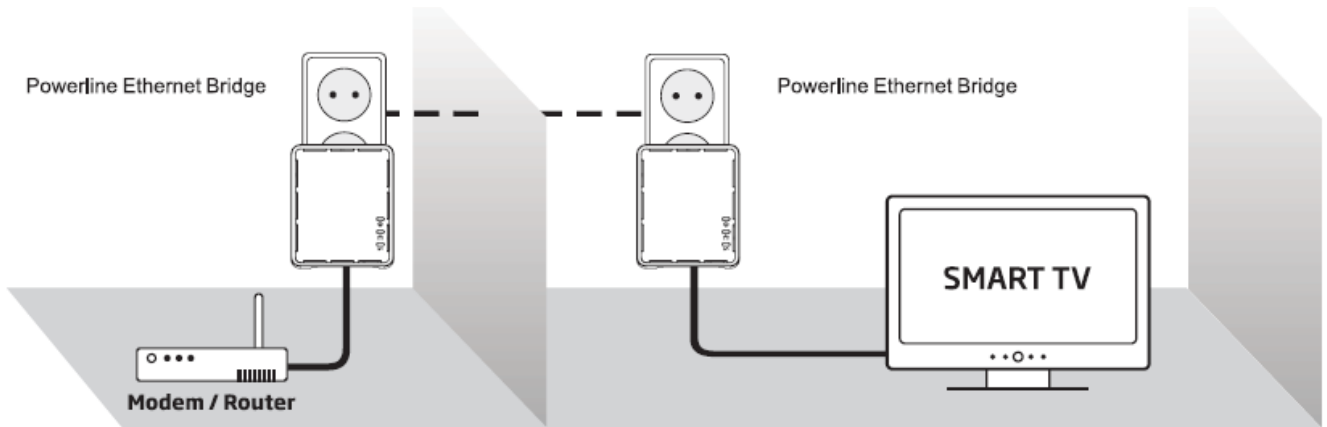
Powerline Ethernet Bridge



2.2.1 Button/LED Descriptions

Button/LED	Description
	<p><u>ON</u>: Power on and ready.</p> <p><u>Blinking</u>:</p> <ol style="list-style-type: none"> 1. Slow blinking (2.0sec ON / 3.0 sec OFF): Sleep mode. 2. Fast blinking (0.5 sec ON / 0.5 sec OFF): PLC group pairing. <p><u>OFF</u>: Power off.</p>
	<p><u>ON</u>: Ethernet connection detected.</p> <p><u>Blinking</u>: Network traffic in transaction.</p> <p><u>OFF</u>: No Ethernet connection detected.</p>
	<p><u>ON</u>: PLC connection detected.</p> <p><u>Blinking</u>:</p> <ol style="list-style-type: none"> 1. Fast : 100Mbps > Powerline data rate > 60Mbps. 2. Normal : 60Mbps > Powerline data rate > 10Mbps. 3. Slow : 10Mbps > Powerline data rate. <p><u>OFF</u>: No PLC connection detected. (Too far for communication or not paired with other devices).</p>
<p>GROUP Button</p>	<p><u>Press 10 seconds</u>: Randomly generate a new network group name.</p> <p><u>Press 2 to 3 seconds</u>: Start paring with the other PLC device. Paring procedure keeps for 2 minutes or ends automatically when they are paired. It can be stopped manually by pressing the button for 2 to 3 seconds again.</p>
<p>RESET Button</p>	<p><u>Press 1 to 2 seconds</u>: Reset to default group name HomePlugAV. Press the button while the device is powered. (not in standby mode)</p>

3. HARDWARE INSTALLATION



Step 1

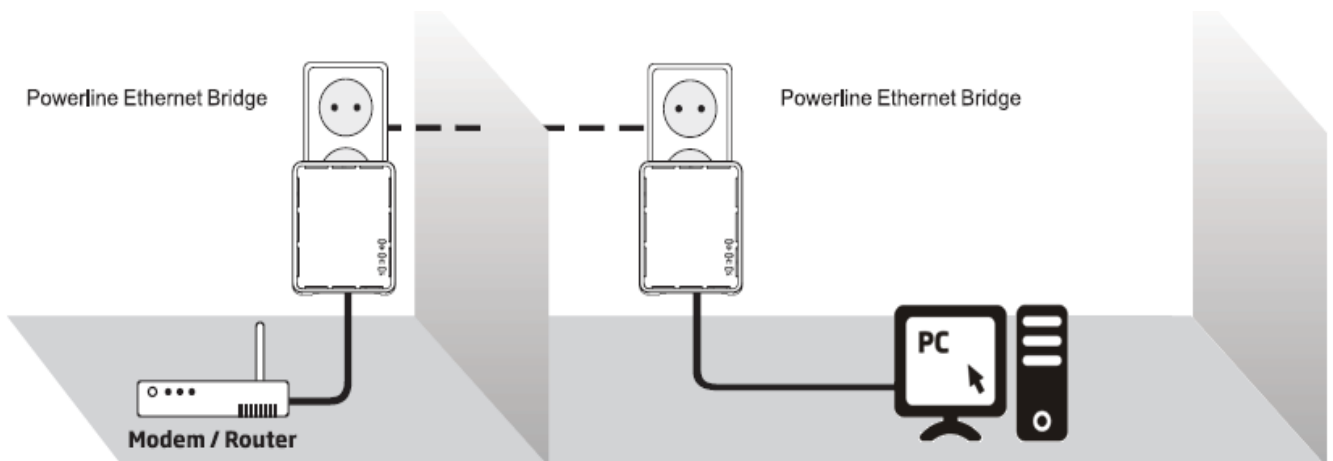
Plug the PLC adapter to a AC outlet and connect to router or broadband modem with an Ethernet cable (provided)

Step 2

Plug another PLC adapter in AC power outlet and connect it with networked device such as Blu-ray player, Gaming console, Smart TV, or Set-Top Box.

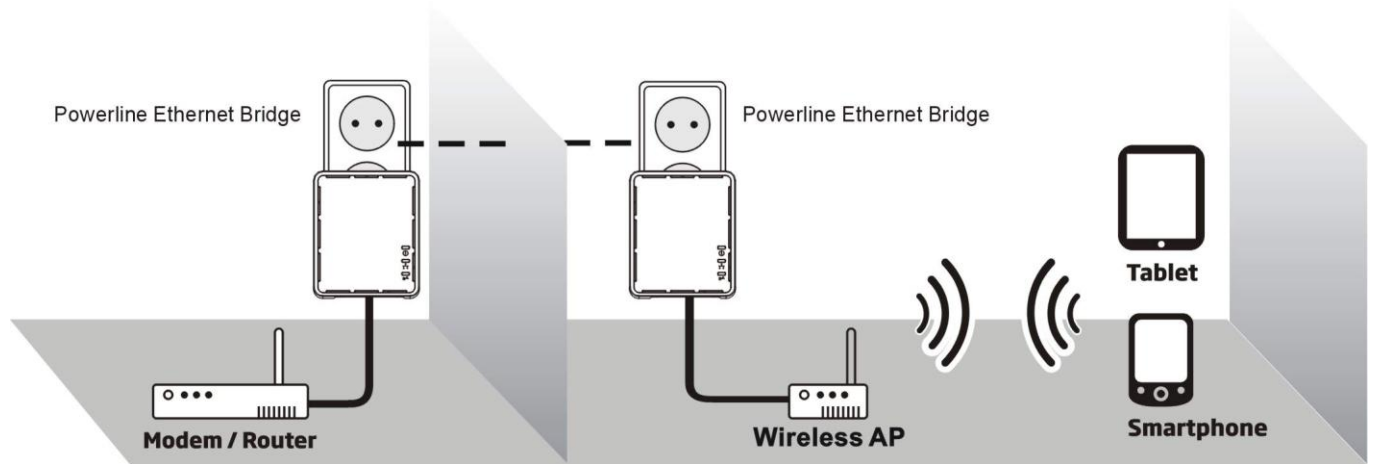
3.1 Application 1 – Provide Network Connection for Your PC

Provide Internet connection for network compatible device such as PC, Blu-Ray player or cable box in any room at home.



3.2 Application 2 – Extend Wireless Access Point Coverage

To extend wireless AP coverage in different room or floor, user can place the Wi-Fi router/repeater near the mobile devices such as iPad, Tablet, Smartphone and Notebook. Then connect the Wi-Fi router/repeater to Powerline device that is connected to powerline network for delivering Internet signal.

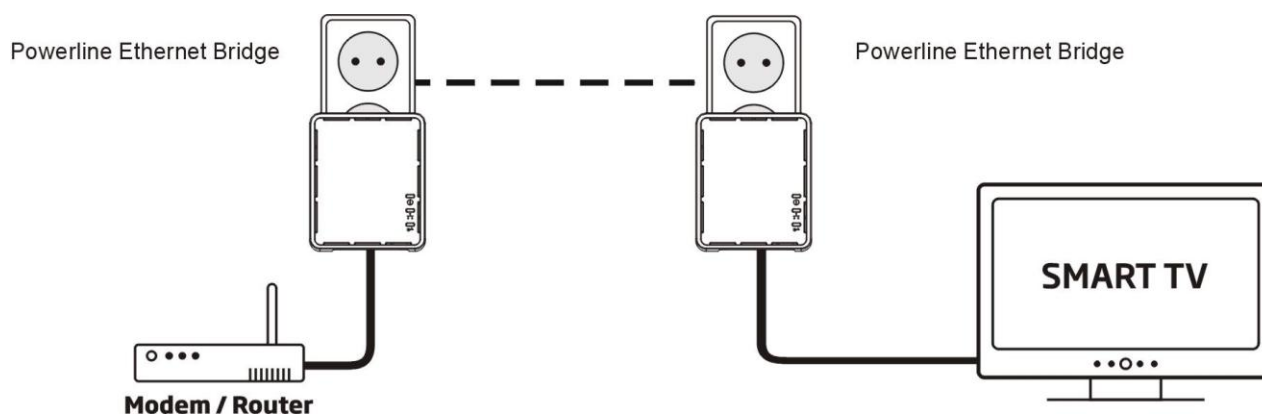


4. ENCRYPTED PLC NETWORK

4.1 Create a Private Encrypted PLC Network Group

The Powerline bridges are compliant HomePlug AV specification. Every ‘HomePlug AV’ compliant PLC device that has the same default network name, “**HomePlug AV**”, is capable of communicating with other “HomePlug AV” devices. This is so called the “**Public Network**”. Two or more powerline devices under the same network can communicate with one another.

If you have a pair of powerline device, either one in the pair can be “device A” or “device B”. By pressing the GROUP button more than 10 seconds; it will generate a random network group (different from HomePlug AV). Users can take the following two steps to change the public network group to the private network group to protect their data while transmitting over the powerline. Users also can create more than one private network groups by pressing GROUP button directly without software installation required.



*NOTE: Put the devices side by side will be more convenient during the setting procedure. After network group is set, the devices can be deployed anywhere at home.

Step I: Clear Group Attribute

Clear the original network group of device B by pressing its GROUP button more than 10 seconds until all LED lights simultaneously turns off and on once. At this moment, its network group name has been changed to a random name. It means that this device is **(1) ready to be assigned another network name** or **(2) to be used as a seed device so other PLC devices can join to a private network group**.

Step II: Join to Other Network Group

1. Press GROUP button of device A for 2 to 3 seconds (make sure POWER LED starts blinking).
2. Press GROUP button of device B for 2 to 3 seconds (make sure POWER LED starts blinking).

The device B which has cleared its group attribute will join to the device A which has not. This step makes device A and B are under the same encrypted network. Additional device C can be added into device A's logical network by taking same steps, thus all of the device A, B, and C in the same encrypted network group. User can assign as many powerline devices into the logical network group as described in the SPECIFICATION section.

*NOTE: It does not matter which device's button is pressed first, but please press the second device's GROUP button **within two minutes** after pressing first device's GROUP button. After 10 seconds, device will start communicating with device A.

4.2 Remove Device from an Existing Network Group

If you would like to remove powerline device from an existing network group, you can generate a new group name (referring to Step I) to stop communication with an existing network group.

4.3 Create Additional Private Network

If you want to create additional private network for your powerline devices that co-existence with your existing powerline private network group, please repeat the **Step 1 & 2** to generate new private network group for selected powerline devices.

P.S. Users can press the RESET button to reset the network name back to its factory default.

4.4 Standby Mode

Standby mode enables the powerline device to save power consumption. The device automatically enters standby if no Ethernet cable is connected, or the PC connecting this device enters standby, hibernation, or powered-off over two minutes. During standby, only POWER LED blinks at slower rate. To exit standby, just insert the Ethernet cable to the device, or wake up the connecting PC.

Note:

Some computers support Wake up LAN function that may cause our PLC can't enter the standby mode.

5. ENHANCE PLC PERFORMANCE

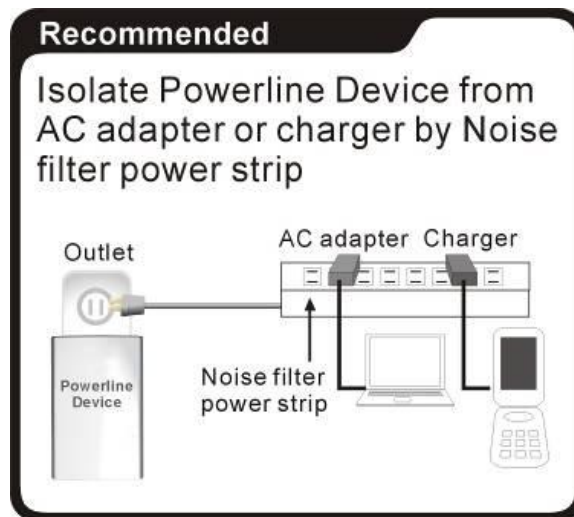
While Powerline device delivers data over the existing electrical wiring in the house, the actual performance may be affected by electrical noises or the length of the wiring. To improve PLC performance, please refer to below recommendations while placing the Powerline device.

AC Outlets Connection

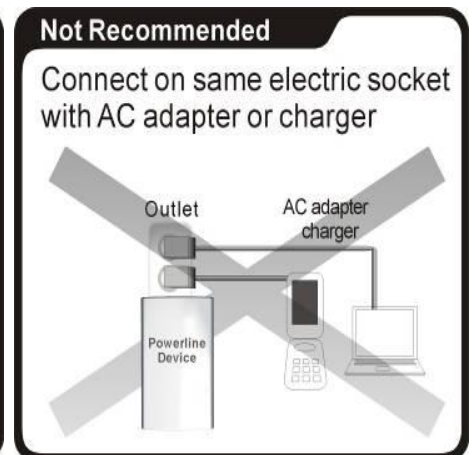
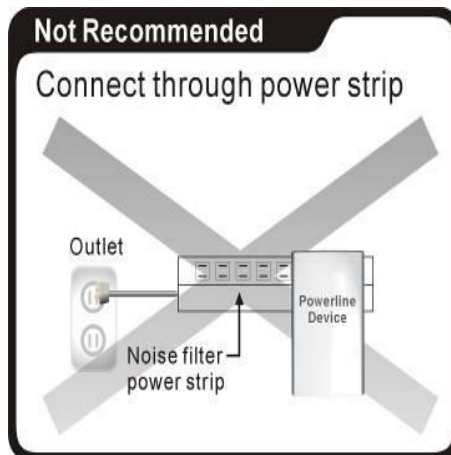
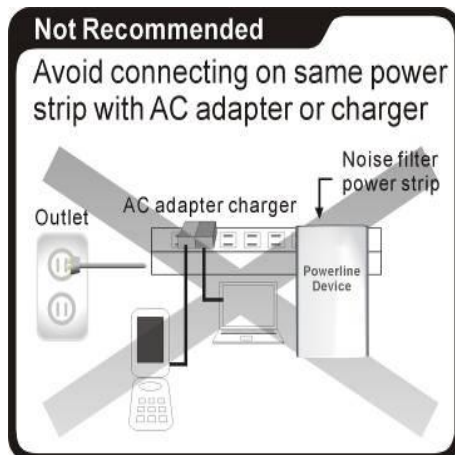
- Avoid connecting PLC device to an uninterruptible power supply (UPS) or backup power supply device. For best results, connect the adaptors directly to a wall outlet is recommended.
- Avoid connecting high-power consuming appliances to the same wall outlet.

See the following illustration:

For better performance, the following connection is recommended.



The following connections are **NOT** recommended.



Connection via Power Strip

If user intends to connect the PLC device via power strip, please follow below reference for better performance:

- Make sure the power strip does not support a noise filter or a surge protector.

Electrical Interference

Some household appliances may produce noise emission. If noise emission is spread over the electrical wiring, it will affect PLC performance in the house. For the best results, we recommend to connect an electrical noise filter with the appliances such as:

- Battery chargers (including cell phone chargers)
- Hair dryers
- Power drills
- Halogen light
- Vacuum cleaner
- Lights or lamps with touch-sensitivity feature supported

Electrical Wiring

The PLC device delivers data over the existing electrical wiring in the house. Actual PLC data transfer rate might vary including the transmission distance between two PLC adapters.

Special Care for Business Installation

Due to several uncertainties that might degrade Powerline performance or block its operation, we DO NOT recommend to install the Powerline devices into business environment. This device has NO GUARANTEE to operate in a business environment such as offices or factories.

- The transmission distance between two Powerline devices is limited by the noise in the electrical wiring.
- PLC communication is supported under the same power meter system. Business environment might include more than one power meter systems and it will cause communication lost among the Powerline devices.

6. SPECIFICATIONS

Items	Description
Product Type	500Mbps Powerline Ethernet Bridge
RJ-45 port	1 port
PHY Rate	500Mbps
Max Data Rate	TCP : 95 Mbps, UDP : 95 Mbps
Frequency Band	2 to 28 MHz, 30 to 68 MHz
Access Methods	TDMA and priority-based CSMA/CA channel access schemes
Modulation	Supports OFDM 4096/1024/256/64/16/8-QAM, QPSK, BPSK and ROBO
Other FW Features	<ul style="list-style-type: none"> * Dynamic channel adaptation and channel estimation maximizes throughput in harsh channel conditions, * Advanced Turbo Code Forward Error Correction, * HomePlug® AV MAC: TDMA and priority based CSMA/CA channel access schemes, * Integrated Quality of Service (QoS) Enhancements * Supports IGMP managed multicast sessions.
Transmission Distance	AC Wire : up to 300 meters
LAN Standards	100 BASE-TX, 10 BASE-T,
PLC Standard	IEEE 1901 compliant /HomePlug AV1.1
Computer OS	OS independent
Max. dev in a network Group	8 Active/ 16 Total
IGMP	Support for IPv4/IGMP v1,v2,v3 snooping
	Support for IPv6 and MLD v1,v2 snooping
Encryption	128-bit AES Link Encryption with key management
LEDs	Power(green), PLC Link/Activity(green), Ethernet Link/Activity (green)
Temperature	<u>Operating</u> : 0~40 °C ; <u>Storage</u> : -20~60 °C
Relative Humidity	<u>Operating</u> : 10~85% Non-Condensing , <u>Storage</u> : 5~90% Non-Condensing
Power Source	100 ~ 240 VAC 50/60Hz
Power consumption	<u>Full load</u> : (230 VAC) = 2.2W;
	<u>Standby mode</u> : <0.5W
Certification	CE, CE-LVD, FCC Class B, RoHS

Technical Support

Diamond Technical Support staff is here to help resolve any issues that you may be experiencing. Prior to contacting technical support please make sure you have the following information available.

1. Model #: (Printed on the bar code, located on the box)
2. Installation CD Version: (printed on the CD label)
3. The version of Windows that your system is running.
4. The manufacturer and model # of your computer.
5. CPU type and speed (example: Intel Pentium4 2.4GHZ)
6. A complete description of the problem that you are experiencing including any steps that you have taken to try to resolve the issue.

Technical Support Options

Free Telephone Support

818-357-5165

(long distance rates may apply)

Mon - Fri, 8 - 4:30 PST

<http://www.diamondmm.com>

SHIPPING

Starting June 1st 2009 Diamond Multimedia will pay for shipping cost from Diamond back to US and Canadian customers provided the product is indeed under warranty and there is no damage caused by improper installation or modification of the merchandise. Customers located outside of the United States and Canada or using military addresses (APO,etc) will be required to pay for return shipping. Average shipping times range from 5 to 10 days, depending on actual shipment destination. Shipments made outside the US may take longer to deliver.

Diamond Multimedia reserves the right to claim for shipping fees along with service charges for any product that is returned incomplete or not under warranty. Return Authorization (RMA) is required for all warranty return products.

ONE YEAR LIMITED WARRANTY

The warranty described below is extended only to the original buyer and is not transferable.

Diamond warrants to the original purchaser of the hardware product, that the product is free from defects in materials or workmanship under normal use and service for a period of one (1) year from the date of purchase. All cables and accessories provided with a Diamond product are warranted to be free from defects in materials or workmanship under normal use and service for a period of for (90) ninety days from date of purchase.

Diamond's sole obligation under this warranty shall be, at Diamond's option, to: (I) repair the defective product or parts; (II) deliver to customer an equivalent product or part to replace the defective product. When a product or part is replaced or exchanged, that item becomes the customer's property and the replaced or exchanged item becomes Diamond's property. When a refund or replacement product is given, the defective product becomes Diamond's property. Replacement parts or products may be new or include serviceable used parts with at least the same functional equivalence to the original product. If, at the time of repair, a product is "out of warranty" or within the last ninety (90) days of the warranty period, Diamond warrants any repair for ninety (90) days. All software provided is subject to the terms of the associated software end-user license agreement.

WARRANTY EXCLUSIONS AND LIMITATIONS

TO BE ELIGIBLE FOR THIS WARRANTY, YOU NEED TO PROVIDE THE ORIGINAL SALES RECEIPT SHOWING THE DATE OF PURCHASE OF THE PRODUCT. DIAMOND MAY REQUEST THE ORIGINAL SALES RECEIPT OR A COPY AS PROOF OF THE DATE OF PURCHASE.

Diamond does not warrant third party products which Diamond distributes "AS IS" unless otherwise specified. Third party products may be warranted by the third party.

Diamond makes no warranty or representation that: (I) the operation of the product will be uninterrupted or error free; (II) defects in the product will be corrected; or (III) that the product will meet Customer's requirements or work in combination with any hardware or software provided by third parties.

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OBTAINING WARRANTY SERVICE: Please review the "help" resources referred to in your products accompanying documentation before seeking warranty service. If the product is still not functioning properly after making use of these resources, please access the support page at <http://www.diamondmm.com/support.php> for warranty instructions and services. Some additional charges may apply for phone support.