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XAV1004 Powerline AV Ethernet Adapter User Guide



NETGEAR

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Manual abstract:

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- Do not service any product except as explained in your system documentation. - Opening or removing covers that are marked with the triangular symbol with a lightning bolt may expose you to electrical shock. Only a trained service technician should service components inside these compartments. If any of the following conditions occur, unplug the product from the electrical outlet and replace the part or contact your trained service provider: - The power cable, extension cable, or plug is damaged. - An object has fallen into the product.

- The product has been exposed to water. - The product has been dropped or damaged. - The product does not operate correctly when you follow the operating instructions. Keep your system away from radiators and heat sources. Also, do not block cooling vents.

Do not spill food or liquids on your system components, and never operate the product in a wet environment. If the system gets wet, see the appropriate section in your troubleshooting guide or contact your trained service provider. · · · ii v1.1, September 2009 · · · · · Do not push any objects into the openings of your system. Doing so can cause fire or electric shock by shorting out interior components. Use the product only with approved equipment. Allow the product to cool before removing covers or touching internal components. Operate the product only from the type of external power source indicated on the electrical ratings label. If you are not sure of the type of power source required, consult your service provider or local power company. To help avoid damaging your system, be sure that the voltage selection switch (if provided) on the power supply is set to match the power available at your location: - 115 volts (V), 60 hertz (Hz) in most of North and South America and some Far Eastern countries such as South Korea and Taiwan - 100 V, 50 Hz in eastern Japan and 100 V, 60 Hz in western Japan - 230 V, 50 Hz in most of Europe, the Middle East, and the Far East Also, be sure that attached devices are electrically rated to operate with the power available in your location.

Use only approved power cables. If you have not been provided with a power cable for your system or for any AC powered option intended for your system, purchase a power cable that is approved for use in your country. The power cable must be rated for the product and for the voltage and current marked on the product's electrical ratings label. The voltage and current rating of the cable should be greater than the ratings marked on the product. To help prevent electric shock, plug the system and peripheral power cables into properly grounded electrical outlets. Observe extension cable and power strip ratings. Make sure that the total ampere rating of all products plugged into the extension cable or power strip does not exceed 80 percent of the ampere ratings limit for the extension cable or power strip. Position system cables and power cables carefully; route cables so that they cannot be stepped on or tripped over. Be sure that nothing rests on any cables. Do not modify power cables or plugs.

Consult a licensed electrician or your power company for site modifications. Always follow your local and national wiring rules. Move products with care; ensure that all casters and stabilizers are firmly connected to the system. Avoid sudden stops and uneven surfaces. Safety and Regulatory Notices FCC Statement The XAV1004 has been tested and complies with the specifications for a Class B digital device, pursuant to 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. 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 according to 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 iii v1.

1, September 2009 reception, which is found 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 or devices Connect the equipment to an outlet other than the receiver's Consult a dealer or an experienced radio/TV technician for assistance Canadian Department of Communications Industry

Canada (IC) Notice This Class B digital apparatus complies with Canadian ICES-003. Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada. Europe EU Declaration of Conformity Marking by the above symbol indicates compliance with EN 55022, EN 55024, EN 61000-3-2, EN 61000-3-3, and EN 50412-2-1. For EU Declaration of Conformity, please visit: http://kb.netgear.com/app/answers/detail/a_id/11621/sno/0 Product and Publication Details Model Number: Publication Date: Product Family: Product Name: Home or Business Product: Language: Publication Part Number: XAV1004 September 2009 Powerline AV Ethernet Adapter XAV1004 Powerline AV Ethernet Adapter Home English 202-10470-01 iv v1.1, September 2009 Contents XAV1004 Powerline AV Ethernet Adapter User Guide About This Manual Conventions, Formats, and Scope

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.1-4 Installing Your Powerline AV Ethernet Adapter .



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When you are connecting peripheral devices to the XAV1004, keep in mind how the devices will be used so that each device has the appropriate Quality of Service (QoS) priority (see "Quality of Service (QoS)" on page 1-6). To connect devices to your XAV1004, follow these steps: 1. Use an Ethernet cable to connect each peripheral device to an Ethernet port on the XAV1004. One Ethernet cable is provided with your XAV1004. Figure 1-6 Installation and Basic Configuration v1.1, September 2009 1-7 XAV1004 Powerline AV Ethernet Adapter User Guide 2. When all peripheral devices are connected, connect the XAV1004 power cord into the unit and into a power outlet.

3. Wait up to 80 seconds for the XAV1004 to be recognized by the Powerline network. Installation and Basic Configuration v1.1, September 2009 1-8 Chapter 2 Securing and Configuring Your Powerline Network This chapter describes Powerline network security, and describes how to use the XAV1004 Powerline Utility. You can use the Powerline Utility to configure encryption for your Powerline network and to check the link rate of traffic passing through the Powerline network. Understanding Powerline Network Security Powerline devices on the same network must use an identical encryption key. The Powerline AV Ethernet Adapter default encrypted password is HomePlugAV. If you do not set up security, anyone nearby with a Powerline network can use this password to gain access to your network. Use the Security button on the Powerline AV Ethernet Adapter to change the Powerline encryption key. Note: If you need to return the Powerline AV Ethernet Adapter to its factory default settings, use the Reset button or the NETGEAR XAV1004 Configuration Utility on your Resource CD.

Encryption of the information you send over the Powerline AV Ethernet Adapter helps keep it secure. This is especially important in locations with many people, such as apartment buildings. A Powerline network consists of Powerline adapters with the same network encryption key. The security used by Powerline AV Ethernet Adapters is similar to the SSID and encryption keys used in wireless networks, but you do not need software to configure your Powerline AV Ethernet Adapters. There are two ways to secure your Powerline network. · Use Push 'N' Secure to automatically generate the encryption on each device in your Powerline network. See the following section, Changing the Default Encryption Key using Push 'N' Secure." Use the XAV1004 Powerline Utility, on your Resource CD, to configure your Powerline network with a network encryption key that you specify. If you are already using HomePlug

2-1 v1.1, September 2009 · XAV1004 Powerline AV Ethernet Adapter User Guide Changing the Default Encryption Key using Push 'N' Secure Push 'N' Secure lets you set the default encryption key on each Powerline device in your Powerline network. To set the encryption key for each device, follow these steps: 1.

@@@2. @@3.

@@@The Power LED will start blinking after you release the button. @@b. @@c. @@Both buttons must be pushed within two minutes. @@The adapters retain security settings even if they are unplugged.

@@4. @@@@Enable or disable the LEDs. @@@@All devices on a Powerline network can be managed from one computer. @@@@Click Next, and follow the wizard prompts. @@3. Click Finish. @@@@1. Go to the XAV1004 program group and select the Upgrade Tool. 2. Click Next to proceed.

The Upgrade Tool finds the adapter. 3. Follow the screen prompts to proceed with the upgrade. @@4. At the end, click Finish when done. Repeat this process to upgrade all the adapters in your network. Resetting to Factory Defaults This option returns the network encryption key to its default value of HomePlugAV. It also returns the firmware to the default firmware version. Only one device at a time can be reset. Note: If you customized your network encryption key, the local Powerline device will be disconnected from the network when you reset it to the factory default.

To avoid this problem, reset all remote devices before you reset the local device. To reset all the devices in your network to the factory defaults: Securing and Configuring Your Powerline Network v1.1, September 2009 2-4 XAV1004 Powerline AV Ethernet Adapter User Guide 1. On the Main tab, click the device name for a remote Powerline device to highlight it. Figure 2-2 2.

Click Factory Reset, and a confirmation message displays. 3. Click OK to reset the device. A message indicates whether or not the operation succeeded. 4. After you have reset each device, check that the Main tab lists all devices in the network. If it does not, click the Scan button to see all the devices in the network. Securing and Configuring Your Powerline Network v1.1, September 2009 2-5 XAV1004 Powerline AV Ethernet Adapter User Guide Running the Powerline Utility You can start the Powerline Utility by clicking the NETGEAR Powerline Utility icon on your desktop, or from the Windows Program menu. The Powerline Utility displays its Main tab: 4 Figure 2-3 Note the message at the bottom of the screen regarding the power saving feature. If the unit goes into power saving mode, the configuration utility will not find it. Keeping a connected Ethernet cable plugged into the device will keep it active. Main Powerline Tab The following table describes the features in the Main Tab. Table 2-1. Configuration Utility Main Tab Field or Button Powerline Devices Network Type Device Name MAC Address Description This shows whether the utility is currently scanning for Powerline devices, or the number of Powerline devices detected, after the scan has completed.

The type of network for the local Powerline device. The default setting is Public. The device name is initially set by the utility. The MAC address for the Powerline device. This is also on the product label, which might not be visible when the device is plugged in. Securing and Configuring Your Powerline Network v1.1, September 2009 2-6 XAV1004 Powerline AV Ethernet Adapter User Guide Table 2-1. Configuration Utility Main Tab (continued) Field or Button Location Description This column shows whether the device is local or remote. The local device is the one connected with an Ethernet cable to the computer that you are using to run this utility. This indicates the Quality of Service (QoS), or the type of traffic that can be handled smoothly: HD Video, DVD Video, or Data.

· HD Video. The device can handle high-definition video traffic smoothly. This status will be shown if the transmit and receive link speed is faster than 80 Mbps. · SD Video. The transmit and receive link speed is faster than 50 Mbps.

· Data. The device cannot handle video data smoothly. This status will be shown if the transmit or receive link speed is slower than 50 Mbps. The link rate for each Powerline device.



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The LEDs are enabled by default.

The firmware version for each Powerline device. Note: Use the provided stand alone firmware upgrade tool to update the firmware. See "Using the Firmware Upgrade Tool" on page 2-4. Change a device name. Reset a device to its factory defaults. See "Resetting to Factory Defaults" on page 2-4. Enable or disable the LEDs for a Powerline device. Scan the network for Powerline devices. Quality Link Rate (Mbps) LED Status Firmware Version Rename button Factory Reset button LED On/Off button Scan button Powerline Security Tab Use the Powerline Security tab to do the following: Changing the Network Encryption Key Adding a Device to a Powerline Network Adding a Device from a Locally Connected Computer Adding a Device from a Remotely Connected Computer Returning to the Default Network Encryption Key Setting Up Your Custom Network Encryption Key Securing and Configuring Your Powerline Network v1.1, September 2009 2-7 XAV1004 Powerline AV Ethernet Adapter User Guide Changing the Network Encryption Key You can change the network encryption key from the Security tab: Figure 2-4 1.

To change the encryption key for a remote device, you must enter the password for the device. The password is printed on the product label. Note: Be sure to save the encryption key for your records after you change it. The encryption key will always display as HomePlugAV after changing. 2. Click the rectangle in front of the remote Powerline device to select it. Figure 2-5 Securing and Configuring Your Powerline Network v1.1, September 2009 2-8 XAV1004 Powerline AV Ethernet Adapter User Guide Note: Be sure to change the password of remote devices before changing it on the local device so that you can maintain connectivity throughout this process. 3. Enter the device password in the Set Device Password window: Figure 2-6 The device password is on the product label.

4. Click OK. 5. Type the network encryption key into the Apply the Encryption Key Setting field, and click Set Selected Devices. 6. Select the Main tab, and click Scan. Check that the devices in the Powerline network appear in the device list. It may take a minute or two for all devices in the network to be detected. Adding a Device to a Powerline Network If you are adding a device to a Powerline network, and the network encryption key has been left at its default setting, all you need to do is plug the new device into a power outlet. If the network encryption key has been customized: . . You can use the Security button to add the new device to your network (see "Changing the Default Encryption Key using Push 'N' Secure" on page 2-2).

You can use the Powerline Utility to add the new device to the network, as described in the following sections. The procedure for setting the network encryption key depends on whether the computer running the Powerline Utility is connected directly to the new Powerline AV Ethernet Adapter (local) or is connected to a different device in the Powerline network (remote). Securing and Configuring Your Powerline Network v1.1, September 2009 2-9 XAV1004 Powerline AV Ethernet Adapter User Guide Adding a Device from a Locally Connected Computer Follow these steps: 1. Plug the new Powerline AV Ethernet Adapter into an available AC power outlet. Connect the Ethernet cable that came with the adapter to the adapter's Ethernet port and an Ethernet port on the computer. 2. Start the Powerline Utility, which displays its Main tab. Wait for the utility to detect the new device. 3.

Click the Security tab. Figure 2-7 4. Select the check box next to the Device Name column, for the device marked as Local in the Location column. 5. Type the network encryption key into the Apply the Encryption Key Setting field, and click Set Selected Devices. 6. Select the Main tab, and click Scan. Check that the devices in the Powerline network appear in the device list. It may take a minute or two for all devices in the network to be detected. Adding a Device from a Remotely Connected Computer If you are using a custom network encryption key, first, set all the devices to the default network encryption key of HomePlugAV so that they can communicate with each other.

Then set all the devices to the network encryption key that you want to use. Securing and Configuring Your Powerline Network v1.1, September 2009 2-10 XAV1004 Powerline AV Ethernet Adapter User Guide Returning to the Default Network Encryption Key Follow these steps: 1. Plug the new device into an AC power outlet. 2.

Start the XAV1004 Configuration Utility and wait for the utility to detect the devices in your Powerline network. Check that all the devices in the established network are displayed on the Main tab. Note: Before you can reset a remote device, you must enter its password. The password is printed on the product label. 3.

On the Security tab, select each check box next to the Device Name column to select every device. 4. Click Use Default (Public Network). The Apply the Encryption Key Setting field changes to the default, HomePlugAV. 5. Click Set Selected Devices. Setting Up Your Custom Network Encryption Key When all the devices are set to the default network encryption key and are plugged in, they are listed on the Main tab. Follow these steps to set up a custom network encryption key for all the Powerline devices: 1. On the Main tab, click Scan. Wait for the new device to be listed.

The new device can be identified by its MAC address. Note: Before you can change the encryption key for a remote device, you must enter its password. The password is printed on the product label. 2. On the Security tab, select each check box next to the Device Name column to select every device. 3. Type your network encryption key in the Apply the Encryption Key Setting field. 4. Click Set Selected Devices. The utility displays a message indicating that the operation was successful.

Securing and Configuring Your Powerline Network v1.1, September 2009 2-11 XAV1004 Powerline AV Ethernet Adapter User Guide 5. Select the Main tab, and then click Scan. Check that all devices are detected with your network encryption key. Prioritizing Traffic on the Powerline Network (QoS) You can prioritize data traffic on your Powerline network by setting the Quality of Service (QoS) for each Powerline device in your network.

On the QoS tab, you can configure the priority for packets forwarding in the powerline network by setting priority values for each device in your network. You do this by defining priorities for VLAN (Virtual Local Area Network) Tags and TOS (Type of Service) Bits. Figure 2-8 On the QoS tab, do the following: 1. Select the device that you want to configure by highlighting it. 2.

Enter the Destination MAC Address, and select the priority. 3. Enter the Destination IP PORT Number, and select the priority. 4. Select the priorities for each VLAN tag from the drop-down lists.



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Securing and Configuring Your Powerline Network v1.1, September 2009 2-12 XAV1004 Powerline AV Ethernet Adapter User Guide 5. (Optional) Select TOS Bits, and select the priorities for each TOS bit from the drop down lists. Note: If both VLAN Tags and TOS Bits are enabled and a frame contains both, the VLAN values will override the TOS values. 6.

Click Apply to set the QoS priority for the selected device. Powerline Utility Logs The Log tab shows system information and a device history table: Figure 2-9 You can delete a device from the device history, save a report, or print a report. Securing and Configuring Your Powerline Network v1.1, September 2009 2-13 Chapter 3 Troubleshooting This chapter gives information about troubleshooting your XAV1004 Powerline AV Ethernet Adapter. Product Registration, Support, and Documentation Register your product at <http://www.netgear.com/register>. Registration is required before you can use our telephone support service. Product updates and Web support are always available by going to: <http://www.netgear.com/support>.

@@ When power is first applied, verify that the Power LED is on. 2. After approximately 10 seconds, verify that: a. The power LED is solid green.

b. The Powerline LED is lit. c. @@@@Powerline LED is off. @@The devices cannot find each other.

Make sure that the Powerline devices are plugged into outlets with power, and that they use the same network encryption key. · If you did not change the network encryption key, move the Powerline device to a closer location. · If the problem occurred after you changed the network encryption key using the XAV1004 Configuration Utility on the CD, press the Reset button to return the Powerline AV Ethernet Adapters to their default settings. If this fixes the problem, see the User Manual for instructions about setting the network encryption key. The color of the Powerline LED indicates the speed of the Powerline link. If the LED is red, the speed is less than 50 Mbps. Switch to another electrical outlet until the LED displays solid green. There is no data traffic. Make sure that: · Your router and modem are switched on and that the Ethernet cable that came in the box is connected to the Powerline adapter port and a router LAN port. · The PC connected directly to the router can access the Internet.

The reset and Security buttons are located on the side panel of the Powerline AV Ethernet Adapter. · Pressing the Reset button longer than two seconds will not reset the device. · Pressing the Security button longer than two seconds will not activate security. Powerline LED is red Ethernet LED is not blinking. Problem using the reset or Security button. Problems After Changing Network Encryption Key If your Powerline devices stopped communicating after you used the NETGEAR XAV1004 Configuration Utility to change the network encryption key, proceed as follows: Troubleshooting v1.1, September 2009 3-2 XAV1004 Powerline AV Ethernet Adapter User Guide 1. Open the XAV1004 Powerline Utility and select the Security tab. Figure 3-1 2. Select the local device.

3. For each remote device, enter its password (printed on the product label), and then select it. 4. Click the Use Default (Public Network) button, and then click the Set Selected Devices button. 5.

Select the Main tab, and check that the utility detects all the Powerline AV Ethernet Adapters in your Powerline network. If the utility detects all your Powerline devices, you can specify a new network encryption key as described in "Changing the Network Encryption Key" in Chapter 2. If the utility does not detect them all, see the following section, "Changing the Network Encryption Key, One Unit at a Time. Changing the Network Encryption Key, One Unit at a Time If the utility does not detect all the devices, you must connect your computer to each Powerline device and set up the network encryption key one at a time, as follows: 1. Select the Security tab in the XAV1004 Configuration Utility.

2. Type the network encryption key that you want to assign in the Apply the Encryption Key setting field, and then click Set Selected Devices. 3. Select the Main tab, and then click Scan. Check that the utility detects all the devices that have been individually set to the same network encryption key.

Troubleshooting v1.1, September 2009 3-3 Appendix A Technical Specifications This appendix provides technical specifications for the XAV1004 Powerline AV Ethernet Adapter. Network Protocol and Standards Compatibility Data and Routing Protocols: Power Power Consumption: Physical Specifications Dimensions: Height: 31 mm Width: 142 mm Depth: 102 mm 0.48 lbs (217 g) 110VAC/60Hz, 5W Max. 220VAC/50Hz, 6W Max.

IEEE 802.3 (10BASE-T), IEEE 802.3u (100BASE-Tx) Weight: Environmental Specifications Operating temperature: Operating humidity: Storage humidity Security Encryption type: Bridge Performance MAC addresses: Bandwidth Powerline Performance Compatibility: Data Transfer Rate: Frequency band: 0 to 40 C (32° to 104° F) 10-90% maximum relative humidity, noncondensing 5-95% maximum relative humidity, noncondensing 128-bit AES 64 200 Mbps Can co-exist without interference with HomePlug v1.0 or HomePlug v1.0 Turbo certified devices; is compatible with HomePlugAV certified devices Up to 200 Mbps with real throughput greater than 80 Mbps 2-30 Mbps Technical Specifications v1.1, September 2009 A-1 XAV1004 Powerline AV Ethernet Adapter User Guide Modulation type: OFDM symbol modulation Electromagnetic Emissions Meets requirements of: Safety Agency Approvals Meets requirements of: UL 60950 /cUL IEC60950; CE LVD; TUV CB FCC Part 15 Class B; CE-EMC Class B; 3-home FCC Certificate Technical Specifications v1.1, September 2009 A-2 .



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