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This warranty does not cover and Proxim will not be liable for any damage or failure caused by misuse, abuse, acts of God, accidents, or other causes beyond Proxim's control, or claim by any entity other than the original purchaser.

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- As a result of any event, circumstance, action, or abuse beyond the control of Proxim, Incorporated

Whether such damages be direct, indirect, consequential, special or otherwise and whether such damages are incurred by the person to whom this warranty extends or a third party.

Harmony OpenAir Access Point Model 7550 User's Guide
Part # 7360.0137
Rev. B

Warranty Return Policy

If you have a problem with the Harmony OpenAir Access Point Model 7550, please call Proxim Technical Support at 1-408-731-2640. Proxim Technical Support will assist with resolving any technical difficulties you may have with your Proxim product.

After calling Proxim Technical Support, if your product is found to be defective, you may return the product to Proxim after obtaining an RMA (Return Merchandise Authorization) number. The product must be returned in its original packaging. The RMA number should be clearly marked on the outside of the box. Proxim cannot be held responsible for any product returned without an RMA number, and no product will be accepted without an RMA number.

FCC WARNING

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 the receiver.
- Connect the equipment into an outlet on a circuit different from that which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

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1. Introduction

Thank you for choosing Proxim's Harmony OpenAir Access Point Model 7550, a member of Proxim's Harmony wirefree infrastructure family. The Harmony product line is the first wirefree networking solution to support all current and future wireless LAN standards, including OpenAir, IEEE 802.11b, and future 10 Mbps frequency hopping and 5 GHz technologies, within a single, homogeneous architecture. Harmony provides centralized management, configuration, and security for a wireless LAN.

Harmony protects current and future wirefree infrastructure investments by supporting all leading and forthcoming wireless LAN protocols. Existing RangeLAN2 and OpenAir-compatible products and existing IEEE 802.11b devices are all compatible with Harmony. Customers can seamlessly transition to new LAN standards by adding low-cost access points without changing the management interface or disturbing existing users.

Harmony's SmartArchitecture™ is the first wirefree management system to provide one-click, system-wide security updates and remote office infrastructure management through a single Web-based interface.

Harmony Access Points can be connected to any portion of the Ethernet network, eliminating the need for special wirefree subnets common in other installations. Also, Harmony clients can roam seamlessly anywhere there is wirefree coverage, without the need for extra client software. In addition, Harmony SmartAttach™ software simplifies installation by automatically discovering and configuring new access points upon connection to the Ethernet network.

Proxim is the leading supplier of wirefree networking solutions. Proxim's unmatched expertise in spread spectrum radio networking technology, combined with the company's extensive experience serving the communication needs of the mobile computing user, have kept Proxim at the forefront of the wireless LAN market.

The Harmony Family

The Harmony OpenAir Access Point Model 7550 is a member of a product family that provides a complete wirefree networking solution.

- ❑ The **Harmony Access Point Controller Model 7560** centralizes the management, security, and filtering capabilities of a wireless LAN. The Access Point Controller communicates with Harmony Access Points over the Ethernet network to provide wirefree network access for mobile clients. The Access Point Controller can support multiple Access Points, even if each Access Point follows a different wireless standard.
- ❑ The **Harmony Access Point** is a networking bridge that operates at Layer 2 of the OSI networking model. Working in conjunction with a Harmony Access Point Controller, the Access Point forwards packets between its radio and the Ethernet network. Two models of the Harmony Access Point are available to support either the OpenAir or IEEE 802.11b wireless standards: the **OpenAir Access Point Model 7550** and the **802.11b Access Point Model 8550**. Note that the 802.11b Access Point does not require an AP Controller to provide mobile clients with wirefree network access.
- ❑ The **Harmony PC Card** is a wireless LAN adapter that fits into a PCMCIA Type II slot in a laptop computer. Two models of the Harmony PC Cards are available to support either the OpenAir (7430 Series) or IEEE 802.11b (8430 Series) wireless standards.
- ❑ The **Harmony 802.11b PCI Card Model 8110** is a wireless LAN adapter that fits into a standard PCI expansion slot and complies with the IEEE 802.11b wireless standard.
- ❑ The **Harmony OpenAir USB Adapter Model 7230** is a wireless LAN adapter that connects to a Windows 98/2000 computer's Universal Serial Bus (USB) port and complies with the OpenAir wireless standard.
- ❑ The optional **Harmony Power System Model 7562** provides remote DC power to Harmony Access Points over the unused pins of a twisted pair Ethernet cable.

System Requirements

To begin using the Harmony OpenAir Access Point, you must have the following minimum requirements:

- At least one Harmony Access Point Controller
- An Ethernet (10Base-T) LAN switch or hub
- At least one OpenAir client adapter (i.e., PC Card, USB Adapter, etc.)

The Product Package

Each Harmony OpenAir Access Point comes with:

- One Harmony OpenAir Access Point Model 7550
- One 10Base-T crossover adapter
- One power adapter (12V, 1 Amp)
- One *Harmony OpenAir Access Point Model 7550 User's Guide*
- One warranty registration card

2. Installation

This chapter describes the installation procedure for the Harmony OpenAir Access Point Model 7550 and includes a description of the LED indicators found on the unit.

Installation Procedure

Follow these steps to install the Harmony OpenAir Access Point Model 7550.

Note:

You must install a Harmony Access Point Controller before installing a Harmony Access Point.

1. If not already attached, firmly screw the antenna, included with the product, onto the antenna connector using a clockwise motion. The antenna connector is located on the side of the Access Point, as shown in Figure 1.



*Figure 1
Attaching the Antenna*

2. If you are not using the Harmony Power System and an AP Power Over LAN Module to supply power to the Access Point, connect the 10Base-T crossover adapter, included with the product, to the 10Base-T port located on the back panel of the Access Point.

Note:

Do not use the 10Base-T crossover adapter with the AP Power Over LAN Module. The AP Power Over LAN Module ships with a 6-inch crossover cable that connects directly to the Access Point's Ethernet port.

3. Determine the best location for the Harmony OpenAir Access Point. Keep in mind the following considerations:
 - The length of the Ethernet cable that connects the Access Point to the network must not exceed 100 meters.
 - Try to place the Access Point on a flat, sturdy surface as far from the ground as possible, such as on top of a desk or bookcase, keeping clear of metal obstructions and away from direct sunlight.
 - Try to centrally locate the Access Point and its antenna so that it will provide coverage to all of the mobile devices in the area.
 - If you are not using the Harmony Power System to supply power to the Access Point, the distance between the Access Point and a power outlet cannot exceed the length of the power adapter's cable.
 - You can install the Access Point and the AP Controller on different IP subnets. Refer to the *Harmony Access Point Controller Model 7560 User's Guide* for details.
4. Place the Access Point in the desired location. The Access Point is designed to sit on a desktop but it also includes four pre-threaded holes for mounting. Refer to the section entitled "Mounting Option" later in this chapter for details.
5. Attach one end of an Ethernet cable to the Access Point and attach the other end to the 10Base-T port of a network hub, switch, router, or patch panel.

Note:

The Harmony OpenAir Access Point does not support 100Base-TX; it only supports 10Base-T.

6. Attach one end of the AC power adapter, included in the product package, to the back of the Access Point and the other end to a power outlet. If you are using an AP Power Over LAN Module and a Harmony Power System to supply power to the Access Point, refer to the documentation that came with those products for installation instructions.

Note:

Use the Access Point only with the power adapter supplied by Proxim in the product package. Using another power supply may damage the Access Point.

All three LEDs on the top of the Access Point will light up when the unit is powered on. Next, the Status LED will turn amber and then green to indicate that the unit is operational. Note that the Status LED will remain amber if the Access Point cannot find an AP Controller to partner with.

Note:

If the Status LED remains amber, the Access Point cannot find an AP Controller to partner with. Refer to Chapter 6 for troubleshooting suggestions.

In addition, the green Link LED will turn on to indicate that the Access Point has a network connection.

7. The AP Controller will automatically detect and configure the Access Point over the network. Refer to Chapter 4 and the *Harmony Access Point Controller Model 7560 User's Guide* for more information on how to configure an Access Point.

Mounting Option

The Harmony OpenAir Access Point is designed to sit on a desktop. However, there are four pre-threaded holes on the underside of the unit so that it may be mounted on any surface. The mounting holes are shown Figure 2. These holes are a #6-32 tap and 0.175" deep. Screws and mounting tools are not provided by Proxim, but an AP Wall Mounting Kit is available. Contact your Proxim reseller for details.

Note:

When mounting the Access Point onto a flat surface, you may need to remove the plastic feet from the underside of the unit so that the mounting holes are flush against the mounting surface. The plastic feet are glued onto the underside of the unit and can be removed with a small flat-head screwdriver.

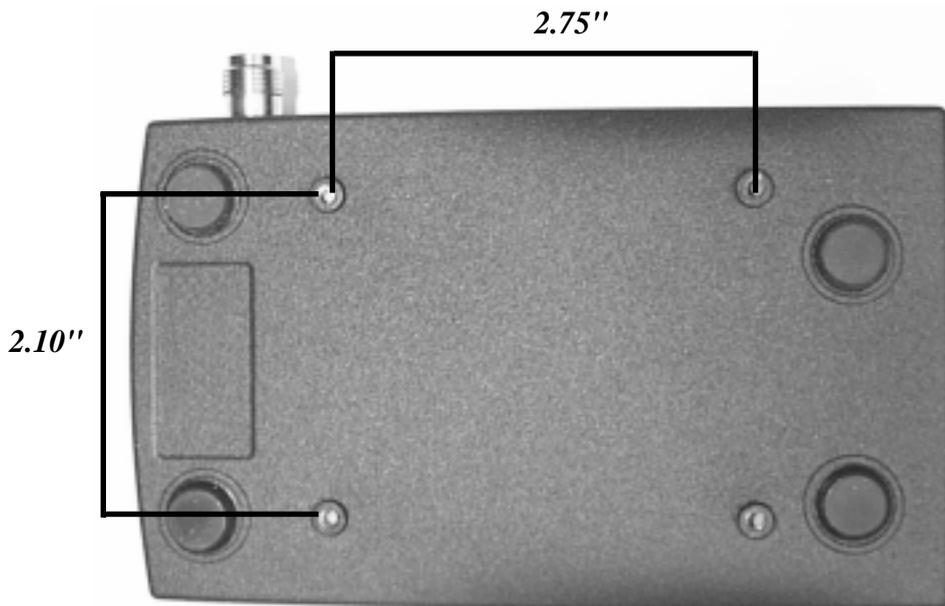


Figure 2
Mounting Holes

Using the Optional Harmony Power System

The optional Harmony Power System provides remote DC power to Harmony Access Points over the unused pins of a Category 5 Ethernet cable. This product simplifies Access Point installation: you only need to run a single cable to the Access Point to provide both power and data.

However, the Harmony OpenAir Access Point must be attached to a Harmony AP Power Over LAN Module Model 7059 to receive power and data from the Harmony Power System.

Figure 3 illustrates how the AP Power Over LAN Module connects the Harmony OpenAir Access Point to the Harmony Power System.

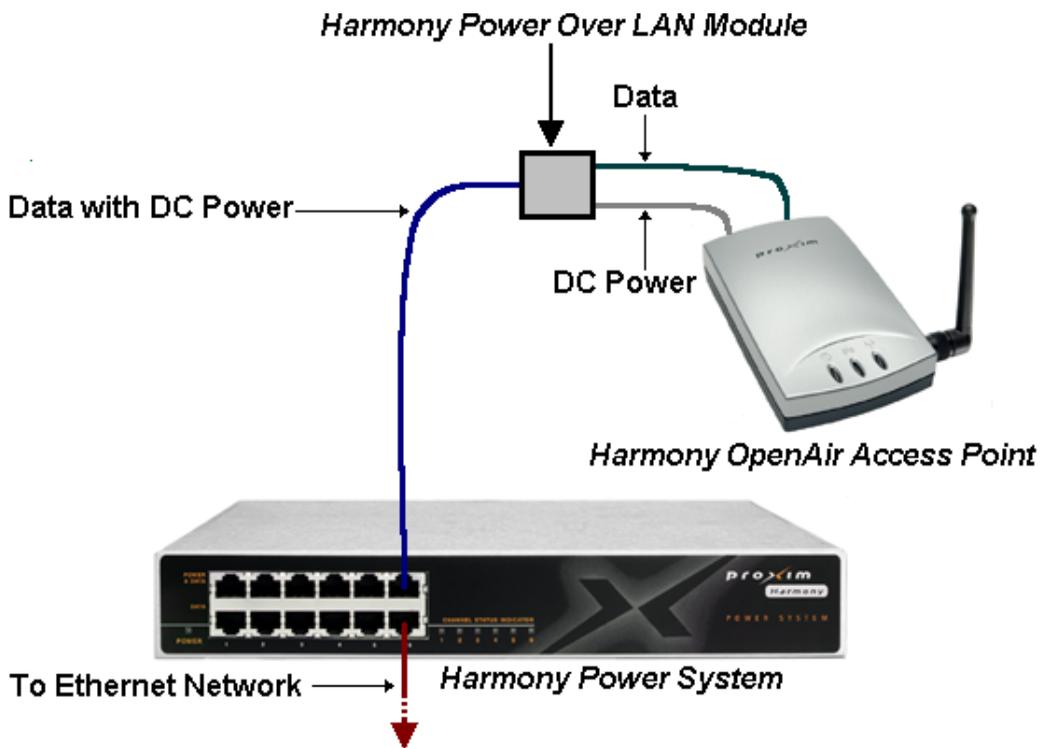


Figure 3
AP Power Over LAN Module

The AP Power Over LAN Module receives the combined power and data signal from the Harmony Power System and then divides this signal into separate power and data lines through two 6-inch cables. The AP Power Over LAN Module includes two six-inch cables that connect directly to the Harmony Open Air AP's DC power and Ethernet connectors. Refer to the *Harmony AP Power Over LAN Module Installation Guide* for more information.

**Note:**

Each Harmony OpenAir Access Point requires an AP Power Over LAN Module to connect to the optional Harmony Power System.

LED Indicators

There are three LEDs on the top panel of the Harmony OpenAir Access Point, as shown in Figure 4.

- ❑ **Status LED:** This LED, located on the left side (with the unit orientated so that you can read the Proxim logo), is green when the unit is powered up and operational. The LED is amber during initialization and when the Access Point is not partnered with a Harmony AP Controller. This LED will blink red in a repeating pattern if a problem occurs with the unit during operation. See Chapter 6 for a discussion of these patterns.
- ❑ **Radio LED:** This LED, located in the center of the three LEDs, blinks amber when the Access Point receives data packets over its radio.
- ❑ **Ethernet LED:** This LED, located on the right side, blinks green when the Access Point receives data packets over the 10Base-T Ethernet port.



Figure 4
Harmony OpenAir Access Point's Top Panel LEDs

There are also four LEDs on the back panel of the Harmony OpenAir Access Point, as shown in Figure 5.

- ❑ **Master LED:** This LED, located between the DC power jack and the serial port, will turn green when the unit is powered on and operational.

- ❑ **Link LED:** This LED, located to the right of the 10Base-T connector, will turn green when the Access Point has a physical connection to the Ethernet network. However, this LED reflects Ethernet activity as well as link integrity. Therefore, when an Ethernet cable is attached and there is Ethernet activity, the LED will blink off momentarily. When a damaged or improper Ethernet cable is attached and the unit attempts to send data through its Ethernet port, the LED will blink on momentarily.
- ❑ The two yellow LEDs are nonfunctional and reserved for future use.



*Figure 5
Harmony OpenAir Access Point's Back Panel LEDs*

The rotary switches, located on the underside of the OpenAir Access Point, and the serial port, located on the back panel of the OpenAir Access Point, are nonfunctional.

Important Note:

The serial port located on the back panel of the OpenAir Access Point is nonfunctional.

3. Wirefree Operation

Harmony Architecture

The Harmony wirefree infrastructure family provides network connectivity to mobile clients without the use of wires or cabling.

Each Harmony System must include at least one Access Point Controller. The AP Controller centralizes the management, security, and filtering capabilities of a wireless LAN. In a traditional wireless LAN, each Access Point duplicates this functionality adding additional, unnecessary cost to the network infrastructure. By consolidating these functions into one or more AP Controllers, additional Access Points can easily be added as the network grows. Also, as new wireless standards are introduced in the future, additional Access Points may be added at a lower cost than with a traditional Access Point infrastructure.

The AP Controller handles all of the configuration and management of an Access Point. On a Harmony network, each Access Point acts as an intermediary between its mobile clients and the AP Controller, converting radio signals into Ethernet packets and vice versa.

A single AP Controller can support a maximum of 10 Access Points (an AP Controller can support more than 10 Access Points but a maximum of 10 APs per AP Controller is the recommended configuration for best performance). A network subnet can support up to 10 AP Controllers to form a Harmony System that can be managed using a single user interface. The number of clients that can be supported by one Access Point depends on the amount of information that each client exchanges with the network. Therefore, the number of clients that can be supported by one Access Point will vary based on the applications in use and how frequently network information is accessed.

When a Harmony OpenAir Access Point is connected to the network for the first time, the AP Controller automatically configures it with the AP Default settings. In addition, an OpenAir Access Point may be manually configured via the Harmony System's Web browser interface. Refer to the *Harmony Access Point Controller Model 7560 User's Guide* for information on how to access the Web browser interface.

The OpenAir Specification

The OpenAir standard describes a set of wireless protocols used by frequency hopping spread spectrum devices that operate in the 2.4 GHz frequency band at a data rate of 1.6 Mbps.

An OpenAir radio changes its operating frequency several times a second. The order in which an OpenAir changes frequencies is known as a hopping pattern or Channel.

The OpenAir standard specifies 15 non-overlapping Channels for operation. These Channels are orthogonal: any two Channels are guaranteed to overlap only once during a hopping cycle. Therefore, Access Points configured for different Channels will not interfere with each other, even when operating in close proximity. The OpenAir operating parameters are described in Chapter 4.

Roaming Between Harmony OpenAir Access Points

If there are multiple Harmony OpenAir Access Points on the network, then a mobile client may seamlessly roam from one Access Point to another.

Each Access Point creates its own wirefree cell or coverage area. This is also known as a Basic Service Area (BSA). A mobile device can communicate with a particular Access Point if it is within the Access Point's coverage area.

If the cells of multiple Access Points overlap, then the mobile client may switch from one Access Point to another as it travels throughout the facility. During the hand-off from one Access Point to another, the mobile client maintains an uninterrupted connection to the network. This is known as "roaming."

Multiple Access Points connected to a common Ethernet network form an Extended Service Area (ESA). All members of an Extended Service Area are configured with the same Domain number and the same Security ID.

Mobile clients must be configured with the same Domain and Security ID as the Access Points on the network; a client can only roam between Access Points that share the same Domain and Security ID.

Roaming Guidelines

- ❑ A Harmony OpenAir PC Card can only roam between Harmony OpenAir Access Points. An OpenAir PC Card cannot communicate with Harmony 802.11b Access Points.
- ❑ All Harmony OpenAir Access Points must have the same Security ID and Domain.
- ❑ All workstations with Harmony OpenAir client adapters must have the same Domain and Security ID as the Access Points that they will roam between.
- ❑ The Access Points' cells must overlap to ensure that there are no gaps in coverage and to ensure that the roaming client will always have a connection available.
- ❑ All Access Points operating in the same vicinity should have a unique Channel/Subchannel pair. Preferably, each Access Point should have a unique Channel. Use the Subchannel only when you have used all 15 Channels in the same coverage area.
- ❑ Access Points that use the same Channel should be installed as far away from each other as possible to reduce potential interference.
- ❑ Proxim strongly recommends that you perform a site survey to determine the best location for each Access Point in the facility, as described in Proxim's free one-day technical training class. See Proxim's Web site at <http://www.proxim.com/support/> for more information on the technical training class.
- ❑ An OpenAir Access Point and an 802.11b Access Point installed in the same vicinity will interfere with each other. If you use both OpenAir and 802.11b Access Points on your network, Proxim recommends that you test for potential interference first before deploying the equipment.

4. Configuration Parameters

The first time a Harmony OpenAir Access Point is connected to the network, the Harmony System will automatically configure the Access Point using the OpenAir AP Default settings.

In addition, a Harmony OpenAir Access Point may be manually configured via the Harmony System's Web browser interface. Refer to the *Harmony Access Point Controller Model 7560 User's Guide* for information on how to access the Web browser interface.

This chapter describes the parameters for a Harmony OpenAir Access Point that may be configured via the Web browser interface.

AP Name

You may assign a name to this specific Harmony OpenAir Access Point. The AP Name cannot exceed 21 characters. The Harmony System assigns an AP Name to each Access Point that it automatically detects and configures. By default, the AP Name is the device's physical address.

Physical Address

A Harmony OpenAir Access Point's physical address is assigned at the factory and cannot be changed by the end user. The physical address or MAC address is a 48-bit unique identifier assigned to each networking device. The physical address is commonly written as six pairs of two hexadecimal digits separated by colons (for example, 00:20:a6:34:00:77).

Enable AP

When enabled, the Access Point operates normally and provides mobile clients with access to the Ethernet network. When disabled, the Access Point cannot partner with an AP Controller or communicate with mobile clients.

Partnered AP Controller

Each Access Point is partnered with one of the AP Controllers (APCs) on the network.

If you do not wish to specify which AP Controller the Access Point should partner with, then select the **Any** option. Otherwise, select an AP Controller from the list of available devices and the Access Point will partner with it.

Domain

In order to establish radio communication, all OpenAir devices must be configured with the same Domain number. Radios on different Domains cannot communicate with each other. The Domain is a software filter that does not affect the actual radio frequency or the frequency hopping sequence.

You may want to set everyone on your network to the same Domain. For larger wireless networks, use the Domain to establish roaming subnetworks throughout your building. For example, the Engineering Department may use Domain 2 and the Sales Department may use Domain 5. Then engineers can only roam within the geographical area mapped out by OpenAir Access Points with a Domain setting of 2.

The Domain is a number between 0 and 15. By default, the Harmony System will automatically assign Domain 0 to an Access Point.



Note:

An OpenAir Access Point will use Domain 13, the Error Domain, until it has successfully partnered with an AP Controller.

Channel

OpenAir devices are frequency hopping spread spectrum devices that change frequencies several times each second in a pseudorandom pattern. The specific pattern of frequencies used by a frequency hopping device is called a Channel.

The OpenAir specification supports 15 non-overlapping Channels for radio communication. Access Points configured for different Channels will not interfere with each other, even when operating in close proximity.

By default, the Harmony System will automatically provide a Channel assignment to a Harmony OpenAir Access Point.

The Harmony System will assign Channel 1 through 15 to the first 15 Access Points. The Harmony System will assign Channel 1 to the 16th Access Point, Channel 2 to the 17th Access Point, and so on.

If necessary, you may manually configure the Channel assignment of an OpenAir Access Point using the Harmony System's Web browser interface. If you have more than 15 Access Points on the network, make sure that units that share the same Channel are as far away from each other as possible, based on the results of your site survey of the facility. This will minimize interference between the two radios.

**Note:**

Proxim recommends that you manually assign Channels if you have more than 15 Harmony OpenAir Access Points on one network.

Subchannel

The Subchannel is a software code that is appended to each radio packet. It does not affect the frequency hopping sequence like a Channel does. Use a Subchannel if you need more than 15 Access Points in the same coverage area and, therefore, all the Channels are used.

For example, you can use Channel 1, Subchannel 1 for Access Point A and Channel 1, Subchannel 2 for Access Point B. The mobile clients in cell A will not communicate with the Access Point or clients in cell B and vice versa. However, both cells are still sharing the same 1.6 Mbps pipe since they are both using Channel 1.

By default, the Harmony System will assign Subchannel 1 to the first 15 Access Points, Subchannel 2 to the next 15 Access Points, and so on.

There are 15 Subchannels, designated 1 through 15. If necessary, you may manually configure the Subchannel for each Access Point using the Harmony System's Web browser interface.

In general, Access Points that share the same Channel should have different Subchannels and be installed as far away from each other as possible, based on the results of your site survey of the facility.

Master Name

The optional Master Name parameter specifies an alphanumeric name to simplify the identification of each Access Point when using a mobile client's radio diagnostic tools.

The Master Name may be up to 11 characters long. The default Master Name is "MASTER."

Security ID

To further improve the security of a radio subnetwork, each OpenAir device requires the same Security ID to establish communication.

The Security ID is used on all OpenAir products. This ID is encrypted and stored in the Harmony OpenAir Access Point itself, not in software. It cannot be accessed but you can change it. If you do change it, however, you will need to change the Security ID on all other radios with which this one was communicating.

The Security ID parameter can be up to 20 characters and is an empty string by default. It is case sensitive.

MAC Optimize

The MAC Optimize parameter can help improve throughput for small networks.

If you have zero or one mobile client communicating with an Access Point, set this parameter to **Very Light**. If you have between two and eight mobile clients communicating with an Access Point at the same time, set this parameter to **Light**. (You can have more than eight nodes synchronized to an Access Point but between two and eight communicating at the same time for the Light parameter setting.) In networks with more than eight concurrent mobile users, set the parameter to **Normal**.

When configured to **Auto**, the default setting, the Access Point automatically determines the number of units synchronized to it and adjusts this parameter accordingly.

Proxim recommends that you configure each of your OpenAir Access Points to **Auto** so that each Access Point can change this setting as necessary.

IP Addressing

An Access Point must have a unique IP address in the same IP subnet as the System's AP Controllers in order to partner with one of the AP Controllers (unless the Access Point is installed on a remote subnet, in which case, refer to the "Subnet Table" section in Chapter 5 of the *Harmony Access Point Controller Model 7560 User's Guide* for details).

Note:

If you have assigned static IP addresses to the System's AP Controllers and you do not have a DHCP server on the network, then the Access Point will not partner with one of the AP Controllers until you have specified an IP address for the Access Point within the Web browser interface.

You can configure an Access Point's IP address in one of three ways:

- The Access Point may receive a dynamic IP address from a network DHCP (Dynamic Host Configuration Protocol) server.
- The Access Point is assigned a default IP address of 169.254.x.y at the factory. This IP address is printed on the underside of the unit along with its serial number and physical (or MAC) address. The Access Point will use this IP address if it is configured to **Use DHCP** and a DHCP server is not present on the network.
- You can assign the Access Point a specific IP address via the Harmony System's Web browser interface. The AP Controller assigns the Access Point the specified IP address using DHCP.

If you want the Access Point to receive an IP address via the first or second method described above, then choose the **Use DHCP** option within the Access Point's configuration screen (accessed via the Web browser interface). Note that **Use DHCP** is the Access Point's default setting.

Otherwise, select **Specify IP** and enter a static IP address, subnet mask, and default gateway in the fields provided.

Click **<SAVE>** within the Access Point's configuration screen to save these changes.

Any changes to the Access Point's IP Addressing parameters will take effect immediately (if the System's AP Controllers are running firmware version 1.1 or greater). However, if you find that the new IP address has not taken effect, try recycling power on the Access Point.

**Note:**

Refer to the Harmony Access Point Controller Model 7560 User's Guide for information on additional Access Point parameters, such as Group Membership and Auto Image Synchronization Upon Reboot.

5. Performance Hints

This section suggests several ways to improve the performance of a Harmony OpenAir network.

Microwave Ovens

Microwave ovens operate in the same frequency band as the Harmony OpenAir Access Point. Therefore, if you use a microwave within range of the Access Point you may notice network performance degradation. However, both your microwave and your Access Point will continue to function.

Antenna Options

The OpenAir Access Point is shipped with a standard directly connected antenna. To install the antenna, screw it clockwise onto the antenna connector. Proxim sells several antenna alternatives, including higher gain omnidirectional and directional antennas that can increase the range of the products. Each of these antennas ship with installation and mounting instructions. For information on additional antenna options, please contact your Proxim Sales Representative.

Range

Every environment is unique with different obstacles, barriers, materials, etc. and, therefore, it is difficult to determine the exact range that will be achieved without testing. However, Proxim has developed some guidelines to estimate the range that users will see when the product is installed in their facility, but there are no hard and fast specifications.

Radio signals may reflect off of some obstacles or be absorbed by others depending on their construction. For example, with two OpenAir radios, you may achieve up to 1000' in open space outdoors where the two antennas have line of sight, meaning they see each other with no obstacles. However, the same two units may only achieve up to 300' of range when used indoors.

Proper antenna placement can help improve range. Here are some guidelines:

- ❑ The antenna should be placed so that it emits its signal in the appropriate direction. For example, the standard antenna shipped with the unit should be mounted vertically. Higher gain omnidirectional antennas may be mounted upside down to the ceiling or a beam. The omnidirectional antenna emits its signal from all sides of the antenna but not from the top or bottom. The directional antenna typically emits a beam only from a front face plate in a horizontal direction. This type of antenna should be mounted against a wall.
- ❑ Place the antenna as high as possible. In an office environment, try to place it above cubicle walls.
- ❑ Do not place a sheet of metal (like a filing cabinet) between two antennas.
- ❑ Two antennas that are communicating should be in the same plane. For example, do not place one antenna on its side and have its partner standing upright.

Using Harmony With Other OpenAir-Compatible Products

Harmony OpenAir products are designed to be compatible with existing devices that use the OpenAir standard, such as Proxim's RangeLAN2 product line.

For example, a RangeLAN2 PC Card can communicate with a Harmony OpenAir Access Point, and a Harmony OpenAir PC Card can communicate with a RangeLAN2 Access Point.

Refer to the *Harmony Access Point Controller Model 7560 User's Guide* for information on how to deploy Harmony on a network that already uses RangeLAN2.

6. Troubleshooting

The Harmony OpenAir Access Point is designed to be very easy to install and operate. However, if you experience difficulties, use the information in this chapter to help diagnose and solve problems. Also, refer to the *Harmony Access Point Controller Model 7560 User's Guide* for additional troubleshooting suggestions. If you cannot resolve a problem, contact Proxim Technical Support, as described in Appendix C, "How to Reach Technical Support."

How to Obtain Help with Your LAN Installation

If you require assistance to install your LAN, Proxim can put you in contact with a Harmony reseller in your area. The reseller is an expert in the design, installation, and maintenance of LANs and will be able to examine your needs and recommend the most cost-effective solution for your LAN, whether you are installing a new LAN or adding on to an existing one. For the location of the Harmony reseller nearest you, contact Proxim at 1-800-229-1630 and ask for the Sales Department.

LED Error Codes

The Status LED, located on the top of the Harmony OpenAir Access Point, will flash red in a repeating pattern to indicate the following errors:

- 1 blink:** Memory error
- 2 blinks:** Flash write error
- 3 blinks:** Ethernet initialization error
- 4 blinks:** Radio initialization error

If you see any of the above flashing sequences, recycle power to the Access Point. If the flashing sequence persists after you have reset the unit, make a note of which of the above patterns you have and contact Proxim Technical Support.

Common Problems and Solutions

Problem 1:

The AP Controller does not automatically detect a new Access Point.

Solution 1:

Follow these steps if an Access Point is not automatically recognized and configured by an AP Controller:

1. Confirm that the Access Point's Link LED is on. This means that the Access Point has a network connection. If the LED is not on, try another Ethernet cable. Also, confirm that you have connected the 10Base-T crossover adapter, included with the unit, to the Access Point's 10Base-T port. If you do not have the 10Base-T crossover adapter, then use a 10Base-T crossover cable to connect the Access Point to the network.



Note:

If you have connected the Harmony OpenAir Access Point to an AP Power Over LAN Module, do not use the 10Base-T crossover adapter.

2. Try recycling power to the unit. The Access Point will try to contact an AP Controller during boot-up. Therefore, if you are using the external AC power supply, you should connect the Access Point to the Ethernet network before turning on the unit.
3. Confirm that the Harmony System's "Allow new APs to be added automatically" parameter is set to True. Refer to the *Harmony Access Point Controller Model 7560 User's Guide* for details.
4. If none of the above solves the problem, try to manually add the Access Point as described in the *Harmony Access Point Controller Model 7560 User's Guide*.

Problem 2:

I can't configure the Access Point locally via the serial port.

Solution 2:

The serial port is nonfunctional. Configure the Access Point using the Harmony System's Web browser interface.

Problem 3:

My Harmony OpenAir PC Card will not synchronize to the Harmony OpenAir Access Point.

Solution 3:

Follow these steps if an OpenAir client adapter cannot synchronize with the Access Point:

1. Try to bring the devices closer together; the client adapter may be out of range of the Access Point.
2. Confirm that the Access Point and client adapter have the same Domain number.
3. Confirm that the Access Point and client adapter have the same Security ID.
4. Confirm that the Access Point's Status LED is green or use the Harmony System's Web browser interface to confirm that it is partnered with an AP Controller. A client adapter cannot synchronize with an Access Point unless the Access Point is partnered with an AP Controller.

Problem 4:

The Status LED is amber.

Solution 4:

The Status LED will turn solid amber under two conditions:

- The unit is initializing
- The unit has successfully initialized but could not find an AP Controller to partner with

Open the Harmony System's Web browser interface to determine if the Access Point has successfully partnered with an AP Controller. If the Access Point is not partnered with an AP Controller, refer to the steps in Solution #1 above. Also, confirm that the AP is enabled. A disabled Access Point cannot partner with an AP Controller.

Problem 5:

The Status LED is blinking amber.

Solution 5:

The Status LED will blink amber if the Access Point requires a new firmware image. The Access Point receives new firmware images from the AP Controller. Refer to the *Harmony Access Point Controller Model 7560 User's Guide* for information on upgrading Access Point firmware.

Problem 6:

The throughput seems slow.

Solution 6:

1. To achieve maximum throughput, verify that your antennas are well-placed, not behind metal, and do not have too many obstacles between them. If you move the client closer to the antenna and throughput increases, you may want to consider adding a second Access Point and implementing roaming.
2. Check the AP Controller's filter settings to confirm that it is not forwarding unnecessary Ethernet traffic to mobile clients.

Problem 7:

How do I upgrade the firmware on an Access Point?

Solution 7:

The Access Point receives new firmware images from the AP Controller. Refer to the *Harmony Access Point Controller Model 7560 User's Guide* for details.

A. Parameters

Parameter Name	Range	Default
AP Name	1-21 characters	unit's physical address
Enable AP	Enabled/Disabled	Enabled
Partnered AP Controller	-	Any
Domain	0-15	0
Channel	1-15	Assigned by Harmony System
Subchannel	1-15	Assigned by Harmony System
Master Name	1-11 characters	MASTER
Security ID	1-20 characters	blank
MAC Optimize	Normal, Light, Very Light, and Auto	Auto
IP Address	Use DHCP, Specify IP	Use DHCP

B. Harmony OpenAir Access Point Specifications

The following technical specification is for reference purposes only. Actual product's performance and compliance with local telecommunications regulations may vary from country to country. Proxim, Inc. will only ship products that are type approved in the destination country.

Network Interfaces	Ethernet 10Base-T (Twisted-Pair)
Data Rate	1.6 Mbps — OpenAir 10 Mbps — Ethernet
Media Access Protocol	OpenAir
Ethernet compatibility	Ethernet packet types and Ethernet Addressing
Frequency Band	2.4-2.5 GHz Worldwide (Depends on country) (spread spectrum frequency hopping)
Independent Channels	15
Output Power	100 mW or 500 mW (Depends on country)
Operating Temperature	-20°C to +60°C
UL Listed Power Supply	The OpenAir Access Point requires an external power supply. The Access Point includes a UL listed, Class 2 power supply. If you have elected not to use the external power supply from Proxim or need a replacement, you must use only a UL listed, Class 2 power supply, rated min. 1A between 6 and 15VDC.

Warning!

It is the responsibility of the installer and users of the Harmony OpenAir Access Point Model 7550 to guarantee that the antenna is operated at least 15 centimeters (6 inches) from any person. This is necessary to insure that the product is operated in accordance with the RF Guidelines for Human Exposure which have been adopted by the Federal Communications Commission.

C. How to Reach Technical Support

If you're having a problem using the Harmony OpenAir Access Point, gather the following information and contact Proxim Technical Support:

- What Harmony products are installed on the network?
- What were you doing when the error occurred?
- What error indication did you see?
- Can you reproduce the problem?

You can reach Proxim Technical Support by voice, fax, e-mail, or mail:

Tel: 800-477-6946 or 408-731-2640

Fax: 408-731-3676

Web: <http://www.proxim.com/>

E-mail: support@proxim.com

Mail: Proxim, Inc.
Attn: Technical Support
510 DeGuigne Drive
Sunnyvale, CA 94085

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