HotPoint

Installation & Setup Guide
HotPoint 4000 Family
Wireless Access Points

HotPoint 4100 Indoor Access Point

HotPoint 4500 Indoor Access Point

HotPoint 4200 Outdoor Access Point

HotPoint 4600 Outdoor Access Point

Manual Revision 1.0 020809
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Safety Instructions

Outdoor HotPoint APs must be installed by a qualified professional. Failure to install this equipment properly may result in equipment damage, personal injury, or death.

Explanation of Graphic Symbols

This symbol alerts the user to the presence of non-insulated dangerous voltage that may be of sufficient magnitude to constitute a risk of lethal electric shock to persons.

This symbol alerts the user to important operating, maintenance, and servicing instructions. Failing to comply with instructions may result in electrical shock.

This symbol alerts the user to the presence of important operating, maintenance, and servicing instructions. Failing to comply with this instruction may result in a hazard.

Do not open the cover

- Dangerous voltages inside.
- No serviceable parts inside.
- Refer to qualified service personnel.
- Unit has tamper-evident labeling that indicates when the cover has been removed.

Caution! Risk of electric shock!

POWER LINES CAN BE LETHAL

Do not install Firetide products where possible contact with power lines can be made. Antennas, poles, towers, guy wires, or cables may lean or fall and contact these lines. People may be injured or killed if they are touching or holding any part of equipment when it contacts electric lines. Make sure there is NO possibility that equipment or personnel can come in contact directly or indirectly with power lines.

ASSUME ALL OVERHEAD LINES ARE POWER LINES

The horizontal distance from a tower, pole or antenna to the nearest power line should be at least twice the total length of the pole/antenna combination. This will ensure that the pole will not contact power if it falls either during or after installation.

SURVEY THE SITE

Look over the entire site before beginning any installation and anticipate possible hazards. Never assume anything without checking it out for yourself! Don't take shortcuts!

TO AVOID FALLING, USE SAFE PROCEDURES WHEN WORKING AT HEIGHTS ABOVE GROUND

- Select equipment locations that will allow safe and simple installation.
- Don't work alone. A friend or co-worker can save your life if an accident happens.
- Don't attempt repair work when you are tired. Not only will you be more careless, but your primary diagnostic tool - deductive reasoning - will not be operating at full capacity.
- Use approved non-conducting ladders, shoes, and other safety equipment. Make sure all equipment is in good repair.
- If a tower or pole begins falling, don't attempt to catch it. Stand back and let it fall.
- If anything such as a wire or pole does come in contact with a power line, DON'T TOUCH IT OR ATTEMPT TO MOVE IT. Instead, save your life by calling the power company.
- Don't attempt to erect antennas or towers on windy days.
- MAKE SURE ALL TOWERS AND POLES ARE SECURELY GROUNDED, AND ELECTRICAL CABLES CONNECTED TO ANTENNAS HAVE LIGHTNING ARRESTORS. This will help prevent fire damage or human injury in case of lightning, static build-up, or short circuit within equipment connected to the antenna. The HotPort outdoor node has built-in lightning protection. Be sure that any other equipment connected to the HotPort node also has the same level of protection.
- The base of the antenna pole or tower must be connected directly to the building protective ground or to one or more approved grounding rods, using 10 AWG ground wire and corrosion-resistant connectors.
- Refer to the National Electrical Code for grounding details.

IF AN ACCIDENT SHOULD OCCUR WITH THE POWER LINES

- DON'T TOUCH THAT PERSON, OR YOU MAY BE ELECTROCUTED.
- Use a non-conductive dry board, stick, or rope to push or drag them so they no longer are in contact with electrical power.
- Once they are no longer contacting electrical power, administer CPR if you are certified.
- Immediately have someone call for medical help.

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Firetide Limited End User Product Warranty

Pursuant to all provisions described herein, Firetide hardware products and Firetide antennas are warranted for one (1) year from the date of purchase against defects in the build materials and workmanship. Firetide does not warrant that the Products will meet any requirements or specifications of any End User Customer. This warranty applies to the entire Firetide product, including the AC power adapter.

Pursuant to all provisions described herein, Firetide software products are warranted for ninety (90) days from the date of purchase against defects in the build materials and workmanship. Firetide also warrants that the Software will materially conform to the documentation supplied by Firetide with the Software. In the event that the Software fails to materially conform to the documentation and an authorized Firetide reseller is notified in writing of such failure within the warranty period, Firetide or its reseller shall use commercially reasonable efforts to promptly correct the nonconformity. Firetide does not warrant that the use of the Software will be uninterrupted or error free.

The above warranties are void if the alleged defect cannot be verified by Firetide or if, as determined by Firetide, the product failure was due to tampering, abuse, misuse, accident, shipping, handling, or storage; or if the product has been installed, used, or maintained in a manner not described in the product user manual; or if the product has been altered in any way; or if product serialization has been altered. Any attempt to disassemble or repair the product by anyone other than Firetide immediately voids this warranty.

This warranty applies only to the original End User purchaser of the product and may not be transferred to any other individual or entity.

THE FOREGOING ARE THE EXCLUSIVE WARRANTIES APPLICABLE TO THE PRODUCT INCLUDING THE SOFTWARE, AND THE EXCLUSIVE REMEDY FOR DEFECTS IN THE PRODUCT. FIRETIDE DISCLAIMS ALL OTHER WARRANTIES, WHETHER EXPRESS, IMPLIED, STATUTORY OR OTHERWISE, INCLUDING BUT NOT LIMITED TO IMPLIED WARRANTIES OF MERCHANTABILITY, NON-INFRINGEMENT OR FITNESS FOR A PARTICULAR PURPOSE. SOME LAWS DO NOT ALLOW THE EXCLUSION OF IMPLIED WARRANTIES SO TO THAT EXTENT THIS LIMITATION MAY NOT APPLY TO YOU.

In no event will Firetide be liable for any special, incidental, consequential, punitive or indirect damages whatsoever (including, without limitation, damages for loss of profits, business interruption, loss of information, or other pecuniary loss) arising out of the use or inability to use the product or the performance, interruption or failure of the product, irrespective of the cause of action, even if Firetide has been advised of the possibility of such damages. Firetide's cumulative liability for all claims arising out of or in connection with this warranty will not exceed the amount paid by the original End User purchaser to purchase the product. The amounts payable for the product are based in part on these limitations and these limitations shall apply notwithstanding the failure of essential purpose of any remedy. Some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages, so to that extent the above limitations or exclusions may not apply to you.

By using the product the original End User purchaser agrees to and is bound by these terms and conditions.

In the event that a product fails to meet this warranty and Firetide's authorized reseller is notified in writing of such failure within the warranty period, Firetide shall, at its own discretion, either repair the product or replace it with the same or a functionally-equivalent product free of charge. Replacement products may contain refurbished materials in whole or in part. Firetide will honor this warranty provided the product is returned through an authorized Firetide reseller or dealer with shipping charges prepaid, along with a proof of purchase describing the original purchase date and product serial numbers if applicable. The authorized reseller must acquire a Return Materials Authorization (RMA) number from Firetide prior to returning any product. Firetide does not accept shipments of defective products without shipping charges prepaid.

Please contact your Firetide dealer for instructions on returning defective or damaged products for repair or replacement. Do not return products to Firetide, Inc. Please keep all original packaging materials in the event they are needed to return the product for servicing.

Chapter 1 Introduction to the HotPoint Family

The Firetide™ HotPoint™ family of wireless access points are the newest addition to the company's line of high performance wireless mesh networking products. HotPoints provide an enterprise-class wireless access solution and can be used as full-function standalone access points, or as part of an integrated, triple-play wireless mesh network. Available in indoor and outdoor models, they include a high power, extended-range radio, multiple antenna options, robust security features, and multiple SSID support.

The Firetide HotPoint wireless access points can serve as companion units to the Firetide HotPort Wireless Mesh Network. Each AP allows 802.11 wireless clients to connect to the network. Such clients include laptops, wireless security cameras, VoIP phones, and portable terminal and POS devices.

Firetide's modular design offers several benefits. Among them are:

- A HotPoint access point can be connected to a Firetide mesh node to provide Wi-Fi access to any location, without the need for backhaul cabling.
- A HotPoint access point can connect directly to a conventional wired infrastructure. This eliminates the need to install a Firetide mesh node in locations where wired connectivity is readily available, while preserving the unified management capabilities for all access points.
- Because the access points and mesh nodes are kept in separate enclosures, they can be independently positioned for optimum RF connectivity.
- A HotPoint access point can share a Firetide mesh node with other devices for true triple-play networking at any mesh node location. This can include a second HotPoint access point operating on a different channel, a video camera, a VoIP device, or even a third party access point.

Firetide HotPort Mesh Network

Firetide's wireless mesh technology provides an ideal backhaul capability for 802.11 client traffic. Together, the systems provide a complete wireless infrastructure. The HotPort system allows standard Ethernet devices to operate on the wireless backbone, creating secure and reliable wireless networks for voice, video surveillance, and data. HotPorts connect wirelessly to each other to form a mesh network. Ethernet packets are automatically switched across the mesh, in a manner analogous to an Ethernet switch, using AutoMesh™, a proprietary protocol developed by Firetide.

AutoMesh has been optimized for efficiency in wireless mesh environments. The patent-pending AutoMesh routing protocol delivers up to 30 Mbps throughput and very low latency of 1.5 ms per hop across the wireless mesh backbone. Traffic prioritization is provided by HotPort mesh 802.1p or port-based quality of service (QoS) while HotPoint APs provide 802.11e and WMM QoS between clients and the AP. In addition, the HotPoint access point supports Turbo Mode, providing up to 108 Mbps data rates for clients using the industry-leading Atheros chip set.

Network Management with HotView Pro Software

HotView™ management software provides full control of Firetide HotPort wireless mesh networks, including HotPoint APs. The software provides access to all mesh and node settings, including security, VLAN, class of service, radio power controls, and network gateway interconnects. Live monitoring features include mesh and node statistics.

HotView Pro extends management across multiple meshes and enables advanced HotPort functionality. Thus, an enterprise can manage all of its HotPort mesh nodes and HotPoint APs worldwide from anywhere.

HotPoint APs can also be managed via a standard web browser.

HotPoint AP Common Features

Firetide's HotPoint family shares a common architecture, and most features are supported on all models. The HotPoint 4100/4200 has a more limited functionality than Firetide's 4500/4600, unless used with the Firetide WLAN Controller. The WLAN Controller offers a wide range of features needed by enterprise-class users for all types of APs. Please refer to the HotView Pro Reference Guide for more information on the WLAN Controller. Key features are summarized in Table 1.

Table 1. Firetide HotPoint AP Family Products & Features

Feature	4100 4200 alone	with WLAN ctlr	4500 4600 alone	with WLAN ctlr
Radio Features				
400 mW transmitter	√	√	√	√
Manual xmit power control	√	√	√	√
Auto channel select	√	√	√	√
2.4 GHz band	√	√	√	√
4.9 GHz band	√	√	-	-
5.0 GHz band	√	√	-	-
802.11d	√	√	√	√
802.11b/g	√	√	√	√
802.11a	√	√	-	-
Turbo mode (for supported clients)	√	√	√	√
WMM QoS	√	√	√	√
WDS server	-	-	√	-
WDS client	√	-	√	-
Security Features				
Rogue AP Detection	-	- *	√	√
802.11i; 40/128 WEP, 128/256 AES, TKIP	√	√	√	√
WPA/WPA2 encryption	√	√	√	√
AES encryption	√	√	√	√
802.1X authentication	-	√	√	√
Login-based authentication	-	- *	√	-
URL re-direction	-	- *	√	-
IP walled garden	-	- *	√	-
802.11f IAPP security handoff	-	-	√	-
802.11r fast handoff	-	√	√	√
Layer 2 / Layer 3 Roaming	-	√	-	√
Intercell blocking	√	√	√	√
Intracell blocking	√	√	√	√
MAC address access control	√	√	√	√
SSID suppression	√	√	√	√
VLANs	4	4	16	16
Network Features				
DHCP client	√	√	√	√
DHCP server	1/VAP	1/VAP	1/VAP	1/VAP
NAT	√	√	√	√
Firewall	√	√	√	√
VPN Tunneling / Filtering	-	-	√	-
Virtualized APs	4	4	16	16
AP Management Groups	-	√	√	√
Virtualized AP Management Groups	-	√	√	√
Fairness among connected STAs (to client level)	-	√	√	√
Per-user rate limiting	√	√	√	√
Per-VAP rate limiting	√	√	√	√
Maximum clients per AP	32	32	64	64
Management Features				
HTTPS access for management	√	√	√	√
SNMP v2/v3	-	√	√	√
Supports pre-configured 2100/2200 HotClients	√	√	√	√
Supports auto-configured 2100/2200 HotClients	-	-	√	√

* Available in a later software release.

Chapter 2 Setting Up Your Equipment - Model 4100 Indoor Installation

Introduction

The Firetide Model 4100 provides enterprise-class 802.11 wireless access. It can operate as a stand-alone device, or with Firetide's Wireless LAN Controller. Configure your HotPoint before installation. Refer to Chapter 6, or the HotView Pro Reference Guide, for details.

Setup - Indoor Model 4100

Setup of your new Firetide HotPoint is simple. The package contents are shown in Figure 1.

The HotPoint needs power. Note that the AC adapter has interchangeable inserts to fit most AC receptacles in the US, Europe, the UK, Australia, and elsewhere. The adapter will operate on any voltage from 100 to 240 VAC, from 50 to 60 Hz. If you need PoE capability, use the 4200.

Figure 1. Model 4100 Indoor Unit - Package Contents

The 4100 needs to connect via a standard Ethernet (RJ-45) cable to the network. Pick a suitable location for the device, and use the supplied power supply to provide power to the unit. The Power LED should illuminate immediately. Attach the supplied antennas to the two antenna connectors. Tighten them firmly, by hand, and point them vertically.

Antenna Note

Note that the supplied antennas are designed for the 2.4 GHz band, that is, 802.11b and 802.11g service. The HotPoint 4100 supports operation on the 5 GHz 802.11a band, but you must use a 5 GHz antenna if you wish to use this band.

Figure 2. Indoor Unit Important Points

The Firetide device needs about a minute to boot itself. When it completes this process, the Status LED will turn green.

Setup - Outdoor Model 4200

The outdoor HotPoint is packed as shown in Figure 3. Note that an Ethernet cable is NOT included. You should obtain a weatherproof 4-pair cat-5 cable long enough to reach from the unit to the indoor location where you will connect with the network. Configure your HotPoint before installation. Refer to Chapter 6, or the HotView Pro Reference Guide, for details.

Figure 3. Model 4200 Outdoor Unit - Package Contents

The cable must be a 4-pair cable; smaller cables will not seal in the waterproof connector. The cable can be pre-terminated; the waterproof connector will pass an RJ-45 plug.

Assembling the Ethernet Cable

Test the unit before mounting it on the pole or mast. Begin by making the cable.

1. Remove the weatherproof Ethernet connector cover - the black plug - from the unit.
2. Dismantle it. You will have a housing, a housing insert, a cap, and a gasket.
3. Place the cap over one end of your Ethernet cable.
4. Place the housing insert over the cable.
5. Thread the cable through the housing.
6. Plug the cable into the RJ-45 port visible inside the HotPoint.
7. Thread the housing back into the HotPoint. Make sure the gasket is still in place.
8. Tighten the cap so that it compresses the housing insert to the housing.

Now you can connect the Ethernet cable to the power feed unit, via the OUT port on the power feed unit. Use a second Ethernet cable to connect the IN port to your PC. Verify operation of the HotPoint before proceeding.

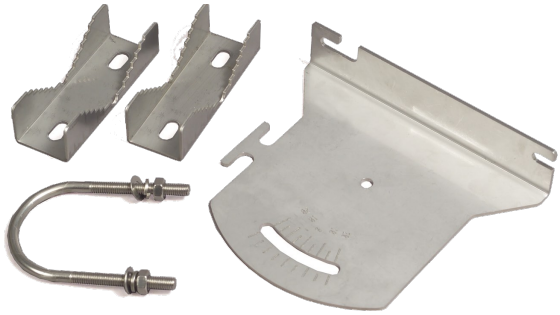
Using the Mounting Bracket

The bracket is designed to allow easy tilting and aiming of the HotPoint. The bracket allows the HotPoint to be mounted with its internal antenna oriented for either vertical or horizontal polarization. It is also designed to allow mounting on either a horizontal or vertical pole. Note that the internal antenna polarization is vertical when the connectors are pointed down.

Antenna Notes

Note that the antenna is built in to the HotPoint. The HotPoint should face the equipment it is intended to connect with. The built-in antenna is designed for the 2.4 GHz band, that is, 802.11b and 802.11g service. The HotPoint 4200 supports operation on the 5 GHz 802.11a band, but you must use an external 5 GHz antenna if you wish to use this band. Otherwise, keep the plastic cover on this connected to prevent water from getting into the unit.

Figure 4. HotPoint Mounting Bracket



In order to avoid climbing up and down the pole twice, power up the HotPoint before proceeding with the installation. The only connection you need is the Ethernet; it provides power as well.

Figure 5. HotPoint Outdoor Unit Connections

Attach the bracket to the back of the HotPoint, using the two slotted holes shown on the right side of the bracket, as shown in Figure 4. Select two holes on the HotPoint according to the desired orientation of the pole and the antenna, as shown in Figure 6, left and center.

Figure 6. Attaching the Bracket to the HotPoint

The bracket is attached to the pole using the U-bolt and one or two of the supplied jaw-clamps (top left in Figure 4). One jaw-clamp is used between the bracket and the pole; the second clamp may be used on smaller-diameter poles by placing it over the U-bolt before putting the U-bolt around the pole.

After placing the U-bolt around the pole, place the bracket over the legs of the U-bolt such that one leg passes through the round hole and the other leg passes through the curved slot. Snug the bracket slightly with the supplied nuts and lockwashers, but do not tighten until you have aligned the unit. The result should resemble Figure 6, right.

Aiming the HotPoint

Figure 7 shows how the bracket can be used to tilt the unit. This is especially useful if service coverage is to be provided near ground level from an AP that is placed high on a pole or near a building ceiling.

Figure 7. Tilting the Unit

The Firetide HotPoint 4200 requires power. Power is fed via Ethernet. Connect the power-feed unit to AC power. The ON light should turn green. Plug the cable from the HotPoint into the port marked OUT. The CONNECT light should turn green. If the FAULT light comes on, contact Firetide.

Figure 8. Power-Feed Unit Connections

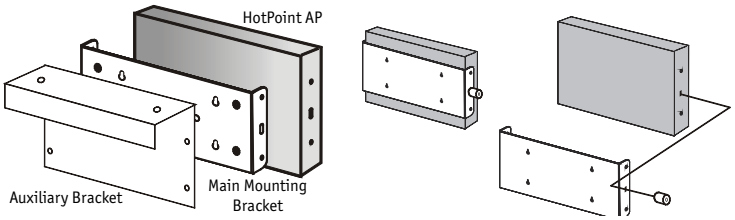
Unpacking and setup are straightforward. The HotPoint 4501 requires AC power, but can be mounted almost anywhere indoors. Brackets are available to facilitate wall or ceiling mounting. You will need a Ethernet cable to connect the AP. Configure your HotPoint before installation. Refer to Chapter 6, or the HotView Pro Reference Guide, for details.

Your AP includes a power supply and three different AC line cords, as shown in Figure 9. Use the one appropriate for your region.

Figure 9. Indoor AP Power Supply

Mount your HotPoint in a location that will give the best wireless coverage of AP clients. The access point does NOT have to be close to its companion HotPort node; in fact, it is better to mount each unit in a location that is optimum for the RF needs of that unit.

Figure 10. Optional Mounting Brackets



Unpacking and setup are straightforward. Included with your HotPoint 4600 are:

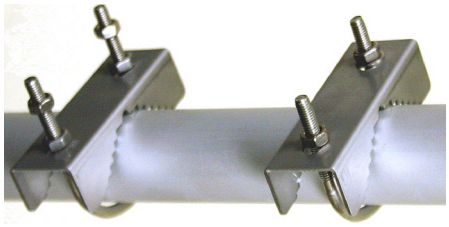
- Mounting bracket and hardware, designed to attach the 4600 to a HotPort 6200 family node. If you are using an outdoor access point as a Standalone unit, a different mounting kit for this purpose is available from Firetide.
- Two indoor-rated 2.4 GHz omnidirectional staging antennas.
- Weatherproof Ethernet cable, 10-pin to 10-pin, PoE-compatible.

You should configure your HotPoint before installation. Refer to Chapter 6, or the HotView Pro Reference Guide, for details.

Pole Installation

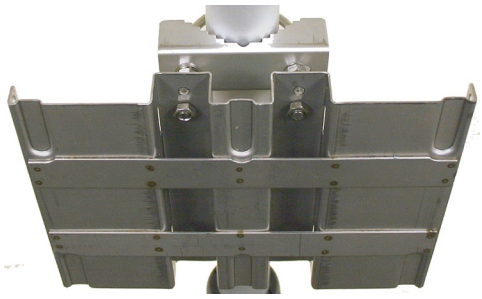
Installation on any pole up to 2 inches is easy. Begin by mounting the supplied U-bolts and 'claw' pieces to the pole, using two nuts, as shown in Figure 11. Make the nuts just finger-tight. Depending on the pole diameter, you may need additional nuts, as shown on the lower clamp of Figure 11. The purpose of the spacer nuts is to prevent the U-bolt legs from protruding too far out beyond the plate. This will interfere with the AP. If required, place two more spacer nuts on the U-bolts.

Figure 11. Pole Clamps



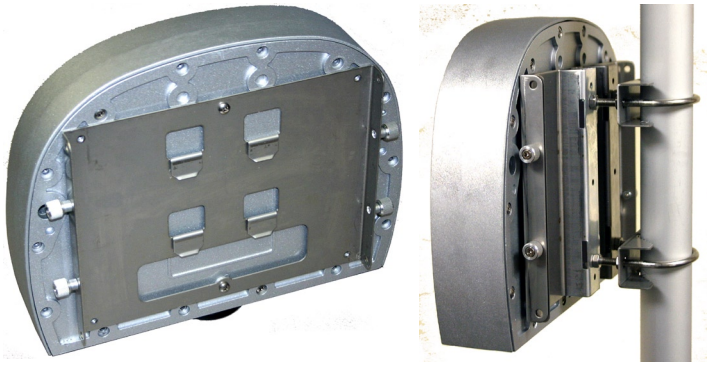
Next, attach the plate, using two nuts, as shown in Figure 12. Adjust the nuts to insure that the U-bolts do not protrude past the fold in the plate. The exact adjustment depends on pole diameter.

Figure 12. Mounting Plate



When the plate is mounted and aligned, tighten all the nuts with a 7/16-inch wrench. Next, slide the HotPoint onto and downward slightly, so that its tabs on its backing plate (Figure 13) engage the mounting plate, as shown in Figure 13. Tighten the four knurled nuts on the sides.

Figure 13. AP Bracket Mounting Tabs & Mounted AP



The supplied antennas can be used for initial deployment, but should be replaced after initial testing with outdoor-rated units of suitable gain and pattern. Complete your installation by connecting the access point to its companion mesh node using the supplied cable, or if you are using it as a Standalone unit, connect it to your Ethernet backbone.

Firetide HotPoint access points can be managed and controlled directly via a wired Ethernet connection, or they can be reached via Firetide Mesh Nodes. A combination of the two is possible as well. These connection methods are known as:

- 'Integrated' operation - each HotPoint is connected to a HotPort mesh router via Ethernet.
- 'Standalone' operation - the HotPoints are connected directly to the enterprise LAN.
- 'Mixed' - a combination of the above.

Note that these terms do NOT refer to the presence (or absense) of a Firetide WLAN Controller or HotSwitch Mobility Controller.

Integrated Operation

Connect the HotPoint access points to their respective HotPort mesh routers. The HotPorts will discover the HotPoints automatically. Manage the APs using either HotView or HotView Pro.

Complete details on the use of HotPoint APs with Firetide's wireless mesh nodes are given in the HotView Pro Reference Guide, included on your CD. Please read it before proceeding. This manual describes only the deployment of standalone HotPoint APs, using a browser for configuration.

Standalone Operation

Connect the HotPoint access points to your enterprise LAN. You will want to connect them one by one and assign each an IP address. HotPoint nodes can acquire IP addresses from a DHCP server; if you use this option, you will need to get the assigned IP addresses from the DHCP server.

HotPoint setup requires only a standard browser. However, browser-based management manages only one HotPoint (per browser window) at a time; it does not offer a global view of all HotPoints, or information on statistics and performance. HotView and HotView Pro do; for details on their use refer to the HotView Pro Reference Guide. Note that HotPoint capabilities are the same regardless of management method; the only difference is convenience, performance statistics, and error logs.

Understanding APs, AP Groups, VAPs, & VAP Groups

Firetide APs support virtualization, so that one physical platform can support multiple virtual instances of an access point.

An AP is a physical system - a computer and a radio - which can implement multiple "virtual" access points. Virtual Access Points, or VAPs, are the logical systems that wireless clients actually see and connect to.

Each HotPoint node offers a range of network as well as radio configuration options. The commands which control these features and options are grouped logically. This makes it easy to manage large collections of physical nodes and virtual APs, once you understand the concepts.

Access Points (AP) - certain parameters, such as radio settings, are specific to the hardware on each particular physical node.

Virtual Access Points (VAP) - HotPoints support Virtual Access Points.

VAP Groups - VAPs are grouped together for management purposes. You will create at least one VAP group, with SSID, encryption, and other parameters. This is the 'access point' that will appear to wireless clients.

Access Point Groups - In some cases, you may want to grant management access to some nodes to one person or persons, and other nodes to other persons. This can be done using Access Point Groups. Each HotPoint may be assigned to an Access Point Group, or AP group. You can specify different user names and passwords for each group.

All HotPoint commands are grouped based on whether they affect settings on a physical node, a VAP Group, an AP Group, or an individual VAP.

Figure 14 shows how the various domains relate to each other.

Figure 14. Matrix of Physical and Logical APs - Simple

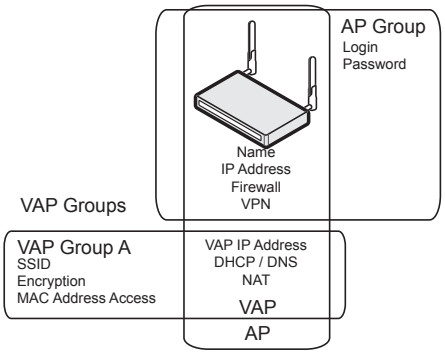


Figure 15 shows more complex arrangements of multiple APs and multiple Virtual APs.

Figure 15. Three-AP Network

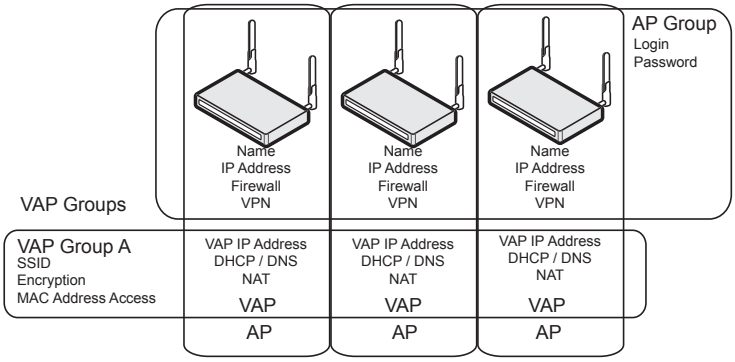
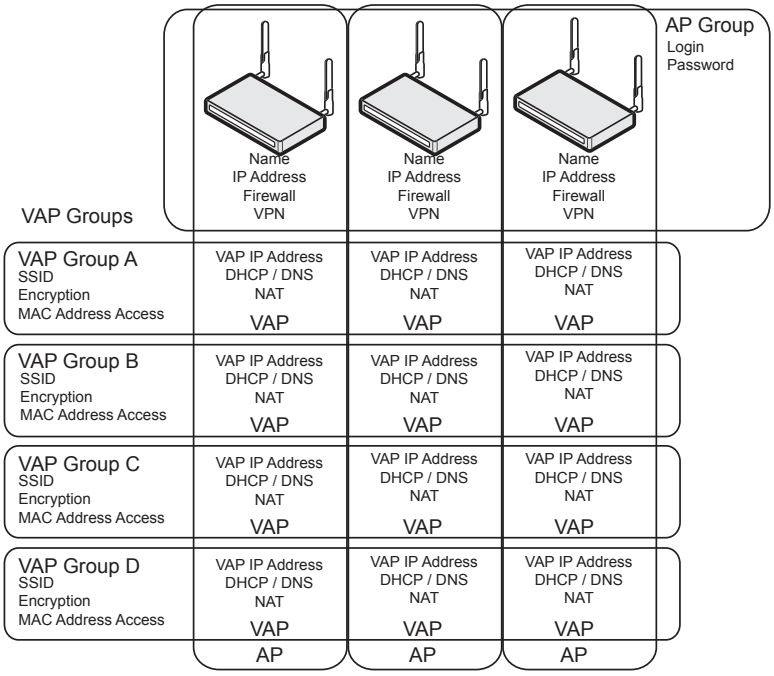


Figure 16 shows a three-AP, three-VAP configuration. You can have multiple VAPs per physical AP.

Figure 16. Large AP Matrix



Basic Setup Sequence

The basic sequence of steps in setting up a Firetide HotPoint access point are summarized here, then shown in detail in the following pages.

If you are installing a new Firetide-based wireless network, begin by installing the HotPort Mesh nodes, and the HotView or HotView Pro mesh management software, before installing any HotPoint APs. Refer to the HotView Pro Reference Guide for details.

1. Configure your PC IP address to access the HotPoint.
2. Assign a management IP address to each HotPoint. The default address options are shown in Table 2. The IP address you pick should be reachable from your computer. It does not need to be on the same subnet as the management address of the Firetide mesh. (Note that if you are using DHCP for Standalone access points, you will need to capture the IP address assigned by the DHCP server to each HotPoint.)

Table 2. Default IP Addresses

HotPoint Connection Method	DHCP Server	Default IP Address
via HotPort node	don't-care	none
Standalone	DHCP available	as assigned by DHCP
	no DHCP available	192.168.224.160

3. Log in to the AP.
4. Set the Country Code.
5. Change the default password.
6. Rename the AP. A name based on the AP's location is a good choice.
7. Set the radio settings (channel, etc) for each physical AP.

Repeat these steps for all access points. Then:

8. Create one or more VAP Groups, using the VAP Group Configuration command. You must have at least one group, even if you only have one AP.
9. Use the VAP Configuration command to configure those VAP features which are controlled per physical AP. (DHCP, DNS, NAT)
10. Use the VAP Group configuration command to assign the SSID, security, and other features for the entire VAP group.

Table 3 gives a summary of all of the major commands and options available on the HotPoint APs, organized by logical group.

Table 3. Summary of Commands by Logical Group

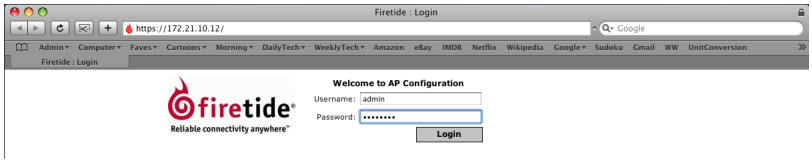
Physical AP	AP Group	VAP Configuration	VAP Group Configuration
AP Name	Membership	DHCP Server DHCP Service IP address VAP IP address	WDS (new group creation only)
AP Mgmt IP address / DHCP client	Guest Login Admin Login	DNS	Broadcast SSID SSID suppression
Performance Statistics		NAT	VLAN
Radio Settings: ch, mode, RF power, beacon			DTIM, RTS/CTS, fragmentation
Firewall			Encryption
VPN			MAC address access
Country Code			Intracell blocking
Reboot / Reset			User data rate control
Import & Apply			IAPP

Firetide HotPoint access points, when used as Standalone APs, can be managed via a secure (HTTPS) browser connection. Firefox, Mozilla, Safari, and Internet Explorer are supported. To connect via a browser, use the URL:

https://192.168.224.160/ (or other IP address, as assigned.)

You will see a screen similar to the one shown in Figure 1. If you don't, make sure your typed **https**, not **http**. Log in using the default values, **admin** and **firetide**. Depending on your browser's security settings, you may receive a warning message, as shown in Screen 2. Click through and complete the login process.

Screen 1. Browser Welcome Screen



Screen 2. Browser Security Warning

Initial Command Screen

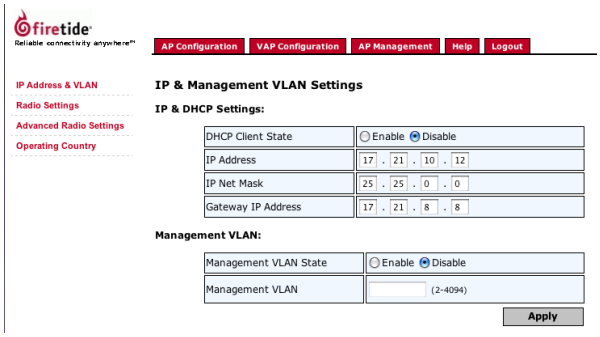
The 'home page' for browser-based management of the HotPoint AP is shown in Figure 17. It shows a summary of the available Virtual APs. If the AP is new, no VAPs will be shown; if the unit has already been placed into service, you will see a list of existing VAPs (as in this case). Model 4100/4200 and Model 4500/4600 have slightly different settings in some screens, but the overall setup is the same.

You will need to configure both 'physical' parameters, such as unit IP address and radio settings, and 'virtual' parameters, such as SSID and encryption.

The setup sequence for each physical unit is:

1. Set the Country Code. You should always do this immediately after any factory reset. The radio operates in a very low-power mode until the country code is set.
2. Change the IP address. On new or reset units, the IP address is set to 192.168.224.160. You should change this to an address that fits your overall IP addressing scheme.
3. Set the radio channel, power, and related parameters.

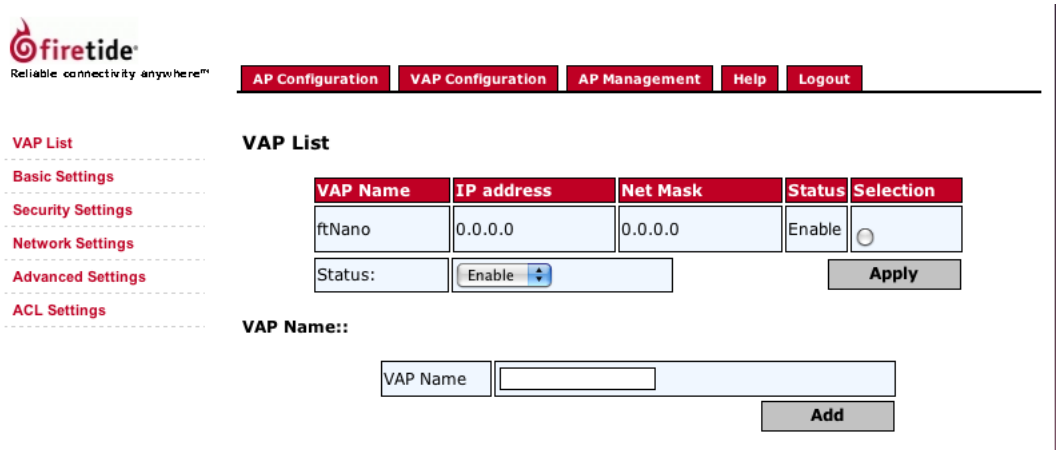
Figure 17. Command Screen



The setup sequence for each virtual access point (VAP) is:

4. Create the VAP Group, or select an existing one.
5. Configure the VAP.
6. Configure the VAP Group.

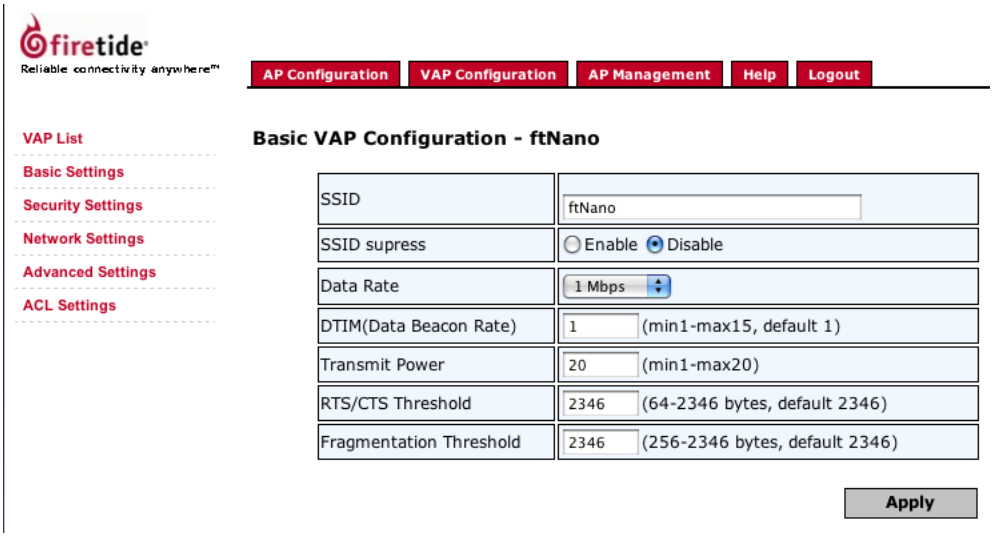
Screen 18. Configuring VAP Groups



Basic VAP Settings

Basic VAP Settings include the SSID, maximum data rates, maximum power, and other SSID parameters. Note that the maximum power level will be less that 26 dBm (400 mW) if you are on a channel where reduced power is required, or if you have reduced power on the main radio settings page. (It is possible to set some VAPs to use less power than the maximum, while leaving other VAPs at full power.) These parameters are set as shown in Screen 3.

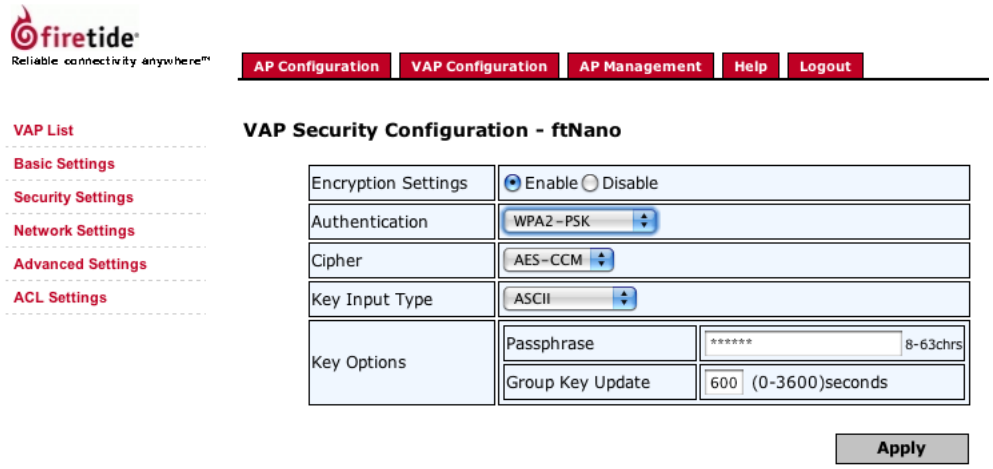
Screen 3. VAP Basic Settings



VAP Security Settings

This is done with the **IP & VLAN** command under the **Management** command, as shown in Screen 4. Enable security, then select the desired type and parameters from the available choices.

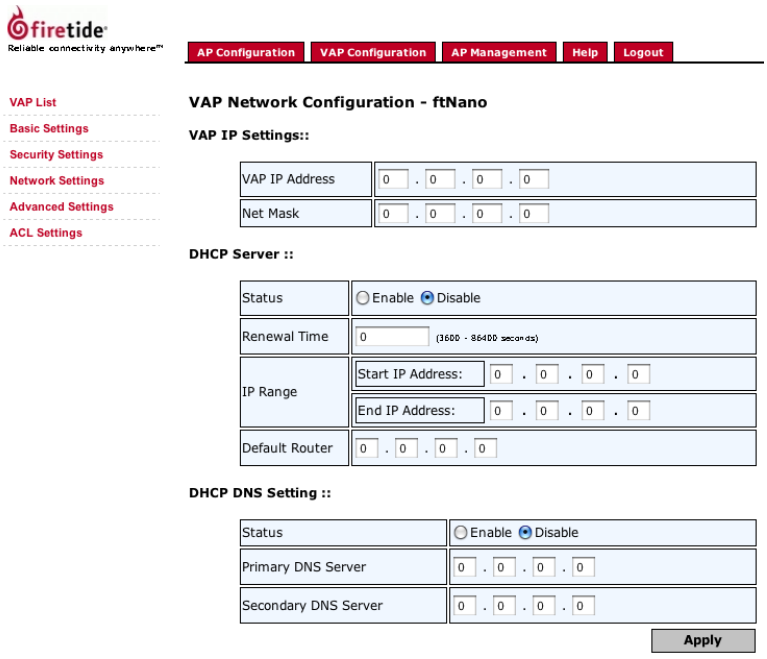
Screen 4. VAP Security Settings



Network Settings

Each VAP has its own network settings, as shown in Screen 5. A VAP has a unique IP address; it is this address that clients see. The VAP IP address does not need to be on the same subnet as the physical AP IP address. The physical AP IP address is used for management only.

Screen 5. VAP Network Settings

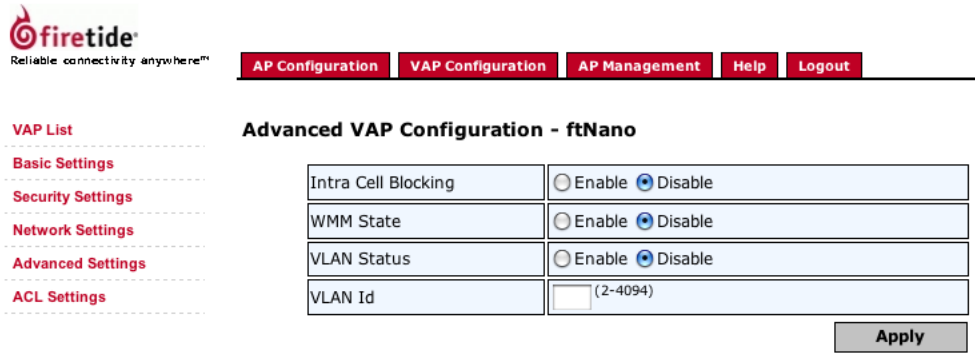


VAP Advanced Settings

In some applications, you may wish to use certain advanced features:

- Intra-cell blocking prevents clients on the same AP from 'seeing' each other. This provides additional security, especially for public hotspots.
- WMM provides QoS support for multimedia applications.
- VLANs provide a method of isolating traffic at layer 2.

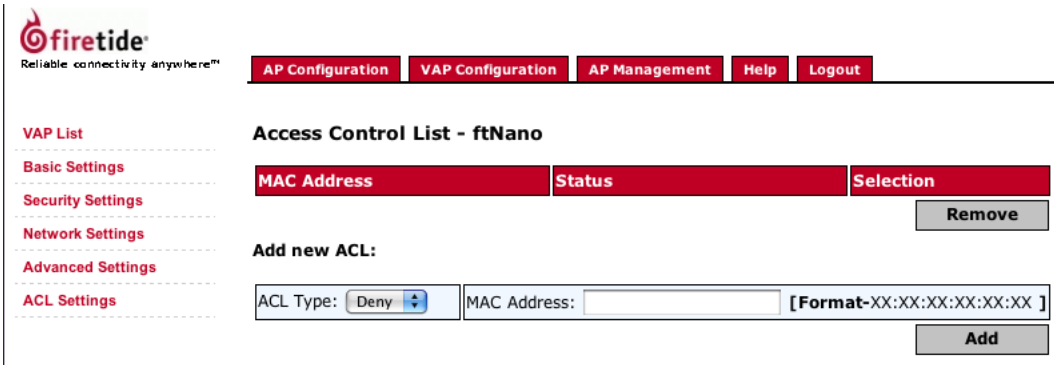
Screen 6. VAP Advanced Settings



Access Control Lists for VAPs

For each VAP, you can define access control lists based on MAC addresses.

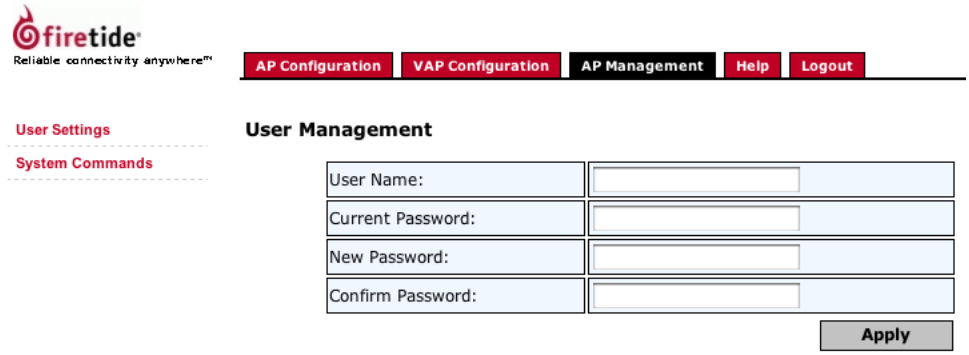
Screen 7. VAP ACL Setup



AP Management - User Settings

The AP Management tab allows you to define administrative access rights for the physical AP. You can also remotely reboot an AP, and remotely restore it to factory default settings. (Keep in mind that resetting to factory defaults will change the IP address to 192.168.224.160. You may need to modify your computer settings to reach the node at this address.)

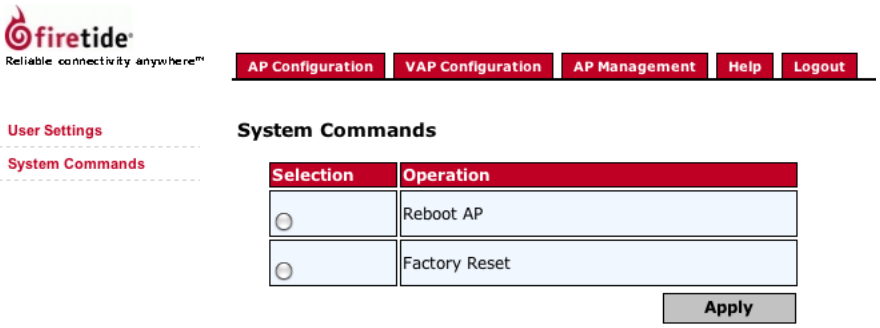
Screen 8. AP Management User Settings



AP Management - System Commands

The AP can be rebooted or factory-reset via this command

Screen 19. AP System Commands



Appendix A Specifications

Common Specifications

These tables describes the technical capabilities of the nodes. Various country restrictions may further limit available choices.

Model	Use
4100	Indoor, Worldwide, 2.4/4.9/5 GHz, 400 mW max
4200	Outdoor, Worldwide, 2.4/4.9/5 GHz, 400 mW max
4500	Indoor, Worldwide, 2.4 GHz, 400 mW max
4600	Outdoor, Worldwide, 2.4 GHz, 400 mW max

Bands (GHz)	Frequency (GHz)	Restrictions
802.11a (4100, 4200)	5.15-5.25, 5.25-5.35, 5.725-5.825	
	4.9-5.090 4.94-4.990	Japan only US Public Safety
	5.470-5.725	ETSI 301.893, U-NII
802.11b/g (all models)	2.412-2.484	

Bands (GHz)	Max TX Power
802.11a, 5.725-5.825 UNII-3	26dBm/6-24Mbps 26dBm/36Mbps 24dBm/48Mbps 23dBm/54Mbps
5.470-5.735 UNII	23 dBm/6-54 Mbps
5.25-5.36 M UNII-2	23 dBm/6-54 Mbps
5.15-5.25 UNII-1	17 dBm/6-54 Mbps
802.11b	24 dBm/all rates
802.11g	26dBm/6-24Mbps 26dBm/36Mbps 25dBm/48Mbps 24dBm/54Mbps

Agency Certifications

Contact your Firetide dealer for product availability and certifications for your country.

Model 4100 Indoor Unit Specifications

Enclosure	Plastic enclosure.
	Two RP-SMA antenna connectors, with 1 pair of 5 dBi 2.4 GHz omnidirectional antennas.
	One DC power connector.
	One RJ-45 Ethernet connector, CSMA/CD 10/100 autosense.
	System indicator LEDs: power, status.
	Weight: 10 oz. (270 g).
	Dimensions: 6" x 4.75" x 1" (150 x 120 x 25 mm).
Power	DC Input: 11-16 VDC, 0.7 A at 12 VDC.
	AC power adapter: 100-240 VAC, 50/60 Hz input; 12 VDC, 1.5A rated output.
Environmental Specifications	Operating temperature: 0° C to +60°C.
	Storage temperature: -40° C to +70° C.
	Humidity (non-condensing): 10% to 90%.
	Storage humidity (non-condensing): 5% to 95%.
	Maximum altitude 15,000 feet (4600 meters).

Model 4500 Indoor Unit Specifications

Enclosure	Plenum rated per UL2043.
	System indicator LEDs (power, uplink, access, status).
	Two antenna connectors: SMA, reverse polarity.
	Power connector.
	One RJ-45 Ethernet connector, CSMA/CD 10/100 autosense.
	Reset button (recessed).
	Security slot for physical locking device.
	Weight: 2.1 lbs (.95 Kg) without external transformer.
	Dimensions: 9.00 in x 5.84 in x 1.07 in (22.85 cm x 14.83 cm x 2.71 cm).
Power	DC Input: 5 VDC, 2.0 A.
	AC power adapter: 100-240 VAC, 50/60 Hz input.
Environmental Specifications	Operating temperature: -20° C to +60°C.
	Storage temperature: -20° C to +70° C.
	Humidity (non-condensing): 10% to 90%.
	Storage humidity (non-condensing): 10% to 90%.
	Maximum altitude 15,000 feet (4600 meters).

Model 4200 Outdoor Unit Specifications

Enclosure	Cast aluminum NEMA-4X/IP66 enclosure.
	One built-in antenna, one N-type antenna connector for optional antenna.
	One weatherproof Ethernet connector, CSMA/CD 10/100 autosense, PoE-compliant per 802.3af.
	System indicator LEDs (power, status, align).
	Weight: 2 lbs (0.9 Kg) without bracket.
	Dimensions: 7.8" x 8.3" x 2.4" (195 x 210 x 60 mm).
	Bracket for pole and wall mounting.
	One weatherized Ethernet transition cable with watertight RJ-45 coupling.
Power	Unit power is via 802.3af Power-over-Ethernet.
	PoE PSE module: AC Input 90-240 VAC, 50-60 Hz, 0.15A.
	Unit power dissipation < 9W.
Environmental Specifications	Operating temperature: -40° C to +60°C.
	Storage temperature: -40° C to +70° C.
	Humidity (non-condensing): 10% to 90%.
	Storage humidity (non-condensing): 5% to 95%.
	Maximum altitude 15,000 feet (4600 meters).

Model 4600 Outdoor Unit Specifications

Enclosure	Cast aluminum NEMA-4X/IP66 enclosure.
	Two N-type antenna connectors.
	One weatherproof Ethernet connector, CSMA/CD 10/100 autosense, PoE-compliant per 802.3af.
	System indicator LEDs (power, status).
	One weatherized Ethernet cable with watertight RJ-45 coupling.
Power	12-18 VDC, or PoE. Do not connect both.
	Unit power is via 802.3af Power-over-Ethernet.
	PoE PSE module: AC Input 90-240 VAC, 50-60 Hz, 0.15A.
	Unit power dissipation < 9W.
	Optional external power supply: 100-240 VAC, 50/60 Hz
Environmental Specifications	Operating temperature: -20° C to +60°C.
	Storage temperature: -40° C to +70° C.
	Humidity (non-condensing): 10% to 90%.
	Storage humidity (non-condensing): 10% to 90%.
	Maximum altitude 15,000 feet (4600 meters).

Appendix B Regulatory Notices

FCC Part 15 Note

These devices comply with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

FCC Class B Notice

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.

FCC Radiation Exposure

To ensure compliance with the FCC's RF exposure limits, the antenna used for this transmitter must be installed to provide a separation distance of at least 70 cm from all persons and must not be co-located or operated in conjunction with any other antenna or transmitter. Installers and end users must follow these installation instructions.

Modifications

Any modifications made to this device that are not approved by Firetide, Inc. may void the authority granted to the user by the FCC to operate this equipment.

Installation

Antenna(s) for the Model 4200 outdoor unit must be installed by a qualified professional. Operation of the unit with non- approved antennas is a violation of U.S. FCC Rules, Part 15.203(c), Code of Federal Regulations, Title 47.

Canadian Compliance Statement

This Class B Digital apparatus meets all the requirements of the Canadian Interference-Causing Equipment Regulations. Cet appareil numerique de la classe B respecte les exigences du Reglement sur le material broilleur du Canada.

Firetide 4100 and 4200 devices are certified to the requirements of RSS-210 for 2.4 GHz spread spectrum devices. The use of this device in a system operating either partially or completely outdoors may require the user to obtain a license for the system according to the Canadian regulations. For further information, contact your local Industry Canada office.

NCC Statement

一、經型式認證合格之低功率射頻電機，非經許可，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。

二、低功率射頻電機之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。

前項合法通信，指依電信法規定作業之無線電通信。

低功率射頻電機須忍受合法通信或工業、科學及醫療用電波輻射性電機設　備之干擾。

Appendix C Ethernet Wiring

Custom cables may be constructed following these wiring connections.

Table 4. Circular, Watertight IP66-Rated Pin Descriptions

Connector Pin #	Wire Color	Port Pin #
1	White/Orange	1
2	Orange	2
3	White/Green	3
4	Blue	4
5	White/Blue	5
6	Green	6
7	White/Brown	7
8	Brown	8
	Drain Wire	9
	Drain Wire	10

Table 5. RJ-45 Connector Pin Descriptions

Pin #	Signal	Description
1	TXD+	TX Data 10 BaseT/100 BaseTX
2	TXD-	TX Data 10 BaseT/100 BaseTX
3	RXD+	RX Data 10 BaseT/100 BaseTX
4	PoE+	Power Input 5 VDC to 48 VDC +
5	PoE+	Power Input 5 VDC to 48 VDC +
6	RXD-	RX Data 10 BaseT/100BaseTX
7	PoE-	Power Input 5 VDC to 48 VDC -
8	PoE-	Power Input 5 VDC to 48 VDC -

Appendix D Reset Procedure

Firetide Access Points may be reset to factory parameters. This is useful when returning a unit from field service or in recovering a unit you cannot communicate with.

To reset a unit, apply power and wait for the unit to fully boot. This takes 60 to 90 seconds. The 'status' LED will glow steady green when the unit is booted.

For indoor units, use a paperclip to press and release the reset button via the small hole on the back of the unit.

For outdoor units, remove the small cover from the reset switch and activate the reset button.

Wait for the units to reboot before removing power. The status LED will glow green again when it is safe to remove power.

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