firetide™

wireless instant networks™

User Manual

HotPoint 1500S Indoor Wireless Mesh Router

User Manual
HotPoint 1500S Indoor Wireless Mesh Router
Part No. xxxxxx

HotPoint Limited End User Product Warranty

Pursuant to all provisions described herein, Firetide products are warranted for one (1) year 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. 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 antennas and the AC power adapter.

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, 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 not-withstanding 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.

Explanation of Graphical Symbols:

This symbol is intended to alert the user to the presence of important operating, maintaining and servicing instructions in the literature accompanying the 1500S. Failing to comply with this instruction may result in electrical shock.

This symbol is intended to alert the user to the presence of important operating, maintaining and servicing instructions in the literature accompanying the 1500S. 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 must be disconnected from power prior to servicing

T a b l e   o f   C o n t e n t s

Firetide™ HotPoint™ 1500S Indoor Wireless Mesh Router

Firetide™ HotPoint™ 1500S wireless mesh routers enable instant deployment of wireless networks and provide a simple and reliable alternative to standard LAN cabling. Deploy Ethernet ports anywhere—instantly! HotPoint routers eliminate costly backhaul wiring for wireless access points and hotspots. In addition, they also enable wireless connectivity for standard networking devices such as computers, printers, access points, surveillance cameras, and Ethernet switches. HotPoint 1500S wireless mesh routers provide a robust, flexible, and scalable LAN backbone solution. Because they form automatically without wires, Firetide mesh networks do not require elaborate site surveys or physical modifications to buildings and workspaces. Network installation costs will drop dramatically because time consuming wiring between offices, walls, floors and different buildings is no longer needed. Provisioning is also easy and fast because special drivers, setup, and interfaces are not required for the equipment you connect to a Firetide instant mesh network. A simple to use management client is available to configure the mesh for each network deployment.

> 📄 **Note: The HotPoint 1500S is an indoor only product. Any modification or enhancement of this product for use outdoors is strictly prohibited.**

The HotPoint 1500S routers provide fast and easy indoor network deployment and their extended throughput ensures higher link performance over longer distances. A Firetide mesh also provides a portable network backbone, so moving your network is as easy as taking your HotPoint routers with you to your new site. HotPoint 1500S indoor mesh routers are fully compatible with HotPoint 1500R outdoor mesh routers enabling the mesh to extend to outdoor applications.

HotPoint wireless mesh routers employ a high performance radio (100mW) for optimized network coverage. Greater throughput between HotPoint nodes enables you to extend your network applications with services that previously required greater bandwidth over expensive cabling. Built into a HotPoint are three standard 10/100 Ethernet ports for connecting standard networked client devices. You can also use one of these ports to link the Firetide mesh network with an existing wired LAN or to the Internet through a DSL modem or gateway device. The mesh node can operate freestanding or mounted to a wall. An external transformer supplies power from a standard 120 volt AC outlet.

Firetide Instant Mesh Network

Firetide developed the Wireless Instant Network, based on the HotPoint Mesh Router, to enable faster, easier and more affordable network deployment. Firetide's patented mesh networking technology (FMRP) Firetide Mesh Routing Protocol makes it possible to survey, plan and deploy an entire network within one day rather than weeks. The Firetide network is also portable. Your entire network can be relocated simply by taking your HotPoint routers with you to your new location.

What is a Firetide Mesh Network?

Firetide mesh networks feature a self-configuring, self-healing, multi-hop topology. Because of these inherent self-organizing properties, a mesh network requires no manual configuration. Thus, creating a new network or adding or relocating network equipment is as easy as powering

up new nodes. The network automatically discovers the new nodes and integrates them into the mesh.

A big advantage of a mesh network is its robustness and ability to heal itself. If a node is disconnected, congested, or fails to operate, neighboring nodes are notified, and data is routed around it. There is no need for a network engineer to intervene, troubleshoot, and cure the problem.
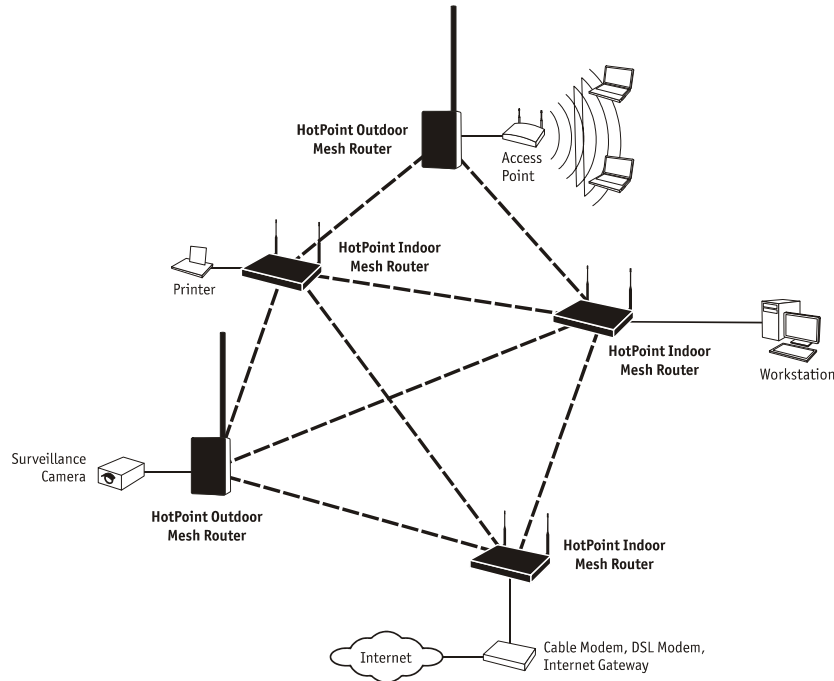
Firetide Mesh Network with Indoor and Indoor Wireless Mesh Routers

Mesh networking can be compared to the Internet, where data can be rerouted on other paths if one path becomes disabled or congested. Losing a node or two or a link won't bring down the entire mesh network. Unlike other WLAN technologies, a mesh network's reliability and scalability can actually improve by adding more nodes and enriching the density of the mesh. More redundant paths means the network in aggregate can handle far more data traffic, and is therefore quite scalable. Mesh networks are ideal whenever the network must be reliable, scalable, and flexible. They are very portable and can adapt to many different physical environments.

Building a Firetide Mesh Network

Installing, expanding, or even relocating a Firetide mesh network is easy and fast. Simply place a HotPoint router wherever you need an Ethernet port and connect it to an AC power source. As long as the HotPoint router is within operating range of other HotPoint routers, you can connect and operate your network devices immediately. Although network planning is often not required for basic installations, adhering to a few simple guidelines will help ensure that your network performs reliably and gives you the full benefits and performance that mesh networking has to offer.

### Use the Correct RJ-45 Ethernet Cable
The type of Ethernet cable to use depends on what you connect to the HotPoint router and whether you are utilizing an Indoor router or an Outdoor router. When connecting the Indoor router to end devices such as video cameras and access points they require crossover cables.

Multi-user devices such as hubs and switches as well as most cable and DSL modems require straight-through (non-crossover) cables. Devices with auto-sensing Ethernet ports can use either crossover or straight-through cables. Refer to "Connecting to the Mesh" in the table of contents. A simple way to determine if you have the correct cable type is to check the left LED on the Ethernet port. If the green LED illuminates, the cable is correct.

*Green LED "ON" indicates correct cable is connected.*

Ethernet 1
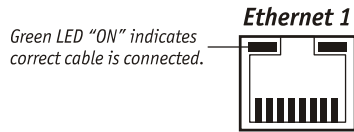
Understand HotPoint Antenna Patterns

HotPoint 1500S Indoor mesh routers have omni directional antennas that radiate in a broad circular pattern perpendicular to the antenna shaft. For optimum coverage, orient the antennas in your mesh network vertically (perpendicular to the ground). Since the coverage of the RF spectrum is different in the various spectrum bands orientation of the antennas will enhance your coverage area.
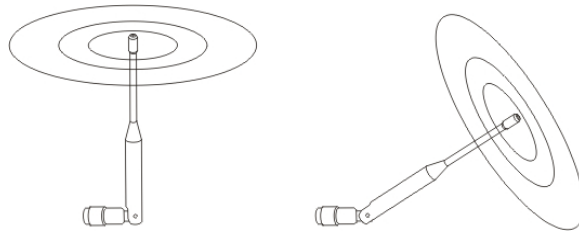
Line-of-Sight Improves Operating Distance

Although HotPoint wireless mesh routers can communicate between walls and buildings, you can increase the working distance of your Indoor mesh router by avoiding obstacles made of dense materials such as concrete and metal. Positioning the HotPoint 1500S units so the space between them provides an unobstructed, line-of-sight view, will greatly increase the effective range and reliability of transmission. They should be located high enough to prevent interference.
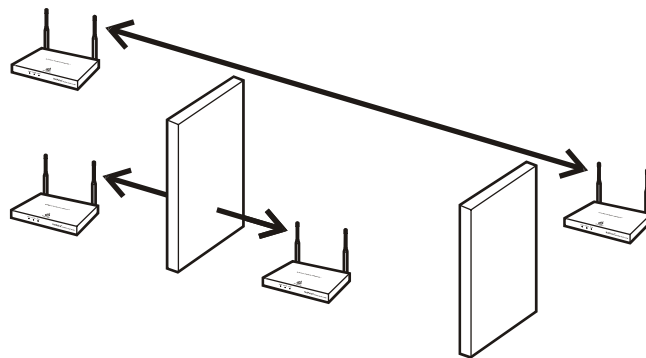
For greater reach, install HotPoint routers within line of sight.

Create a Mesh Topology for Maximum Performance and Reliability
Unlike simple point-to-point bridging, Firetide provides true mesh networking with flexible and redundant paths. This improves overall performance, allows the network to be extended over long distances, and reduces the chance of single point failures. To fully benefit from the self-forming and self-healing properties of the mesh, place each HotPoint router within direct range of two or more HotPoint routers. It is not recommended to install your HotPoint network in a linear, point-to-point configuration. The Firetide network protocol is optimized for two and three dimensional topologies including vertical connections between multiple floors in a building.
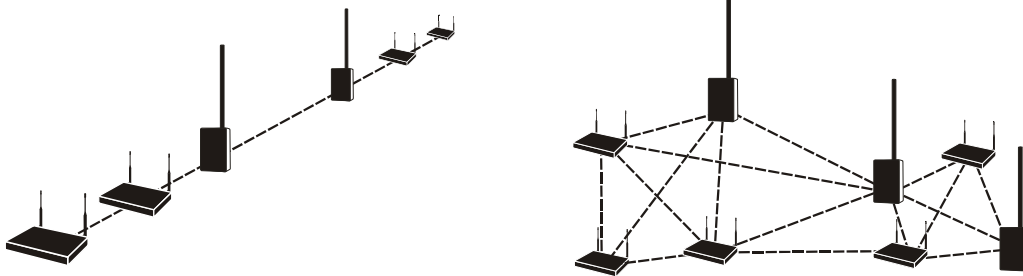
Linear or Point-to-Point Topology (incorrect)   Multipoint to multipoint Mesh Topolgy (correct)

Linear vs. Mesh Topology

Use the HotPoint Manager Software
Although this software is not required for installing or operating your network, the HotPoint Manager software provides an easy way to monitor and manage the mesh and your HotPoint routers. Because wireless connections between HotPoint routers are invisible, this software lets you "see" which units are within direct range of each other. HotPoint Manager also provides additional security and optional configuration features. You can download the software from the Firetide web site.

HotPoint Manager™ Software

The HotPoint Manager software provides a convenient, browser-based interface for monitoring all of the HotPoint routers on your mesh network. HotPoint Manager is a Java-based application compatible with most Internet browsers and platforms including Windows, Macintosh, UNIX, and Linux. Registered users can download the HotPoint Manager software and documentation from the Firetide web site (www.firetide.com).

Downloading and Installation Instructions
1. Go to the Firetide web site www.firetide.com/
2. Select Support and then select Downloads from the menu
3. Read the instructions provided and download the appropriate version of the software and documentation. You will be asked to log in or to register before being permitted to download.
4. Install the software on your workstation as directed in the HotPoint Manager User Guide.
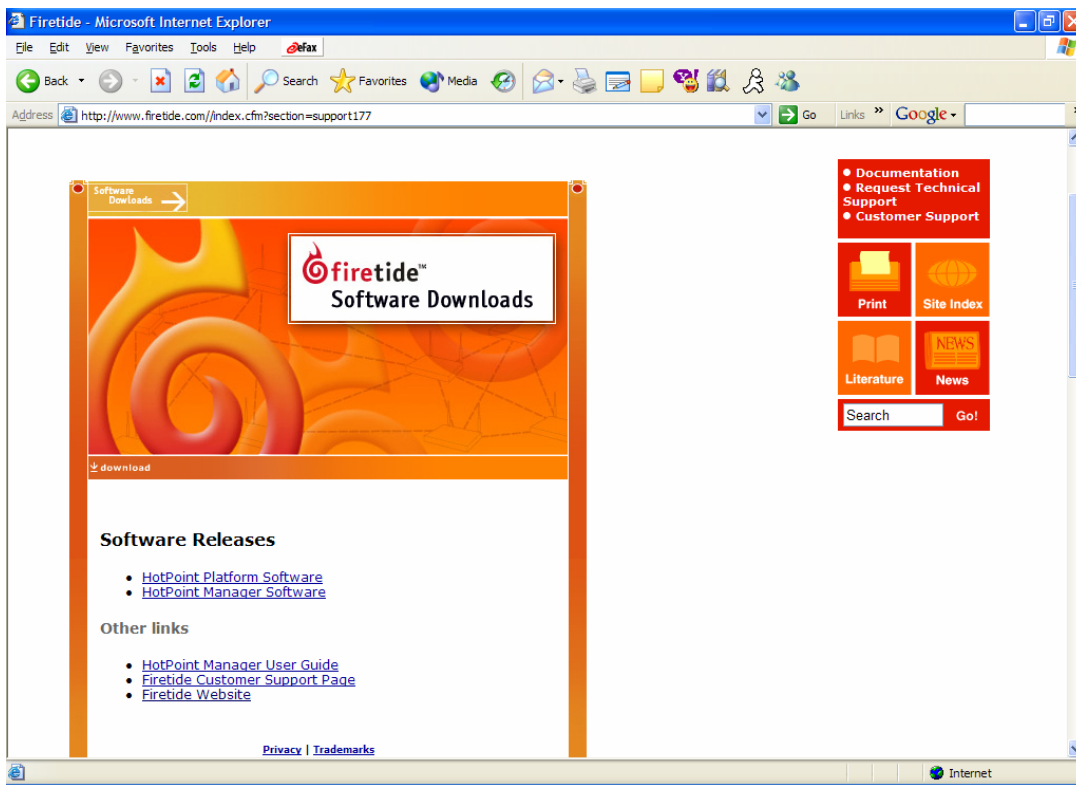
Connecting to the Mesh

If your mesh network consists of HotPoint 1000S indoor mesh routers and HotPoint 1000R outdoor mesh routers, we recommend connecting your workstation to an indoor unit so you can avoid having to make the connection outdoors.

If you are connecting the workstation directly to the HotPoint 1000S, an Ethernet crossover cable is required. If you are connecting the workstation through a switch, then a straight-through Ethernet cable is required. Many newer switches support MDIX (Medium Dependent Interface Crossover, where the "X" represents crossover) and when connecting to those switches the type of Ethernet cable does not matter.

HotPoint Outdoor
Mesh Router

HotPoint Indoor
Mesh Router

HotPoint Manager
Workstation

Ethernet Crossover Cable

HotPoint Outdoor
Mesh Router

HotPoint Indoor
Mesh Router

Switch

HotPoint Manager
Workstation

Straight-through
Ethernet Cables
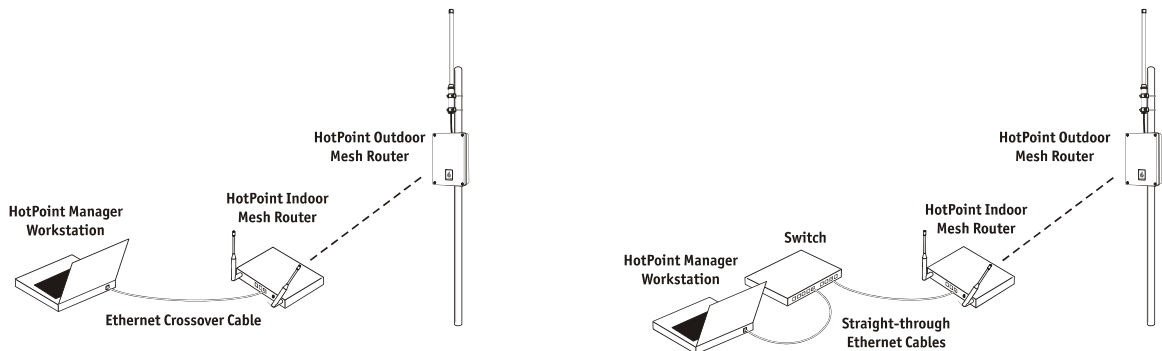
Connecting a HotPoint Manager workstation to an indoor mesh router directly or through a switch.

Connecting to the Mesh Network
1. Be sure all of your HotPoint routers are installed and powered.
2. Connect your workstation's network adapter directly to any one of the HotPoint routers using an Ethernet cable.
3. Turn on your workstation and configure your TCP/IP settings to:
   - IP address: 192.168.224.200
   - Subnet mask: 255.255.255.0
   - Gateway is not used

4. Refer to your operating system documentation to configure for the static address in step 3.

Getting Started with HotPoint Manager
For complete information on HotPoint Manager features and more detailed instructions on its operation, download the latest HotPoint Manager User Guide available at www.firetide.com

Steps 1 and 2 are for launching HotPoint Manager under Windows. Your operating system may have a different procedure for launching applications.
1. From the Windows Desktop click on the Start button
2. Click on All Programs and select HotPoint Manager. The Login screen will appear.
3. Enter the following information to log into the mesh network
• Username: admin
• Password: admin
• Mesh IP address: 192.168.224.100

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4. Click on Login to start
5. Wait for your computer to connect to the mesh. This may take a few seconds to several minutes depending on how many routers are in the mesh.
6. You should see the screen shown on the following page with a list of all of the HotPoint units on the mesh.


> 📄 **Note: If this screen does not appear, or some of your HotPoint mesh routers appear to be missing from the list, refer to Appendix B – Troubleshooting.**

Configuring to the Mesh

To configure the mesh it is recommended to connect the mesh utilizing the default configuration and then change the parameters desired with HotPoint Manager. This will save you time and ensure the entire mesh is configured the same. You can change the SSID, Channel, Encryption and IP address on all nodes rather than changing one at a time.

Configuring the TX mode and Channel Selection

Using the Hotpoint Manager the Mesh Administrator is provided a selection of operating modes (e.g., 802.11a, 802.11b, or 802.11g) along with a selection of channels for that mode. In this way the administrator is only able to operate the mesh in full compliance with approved certified frequencies.
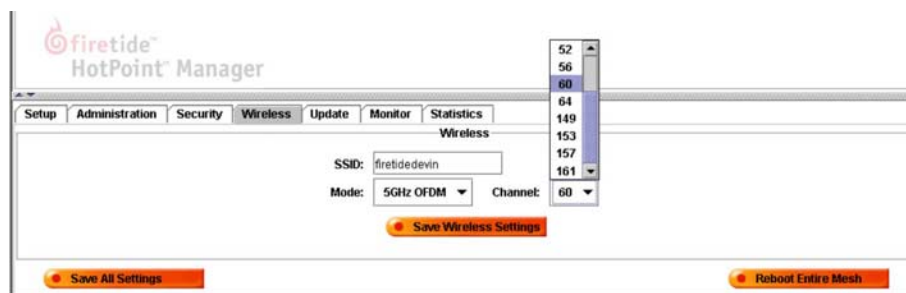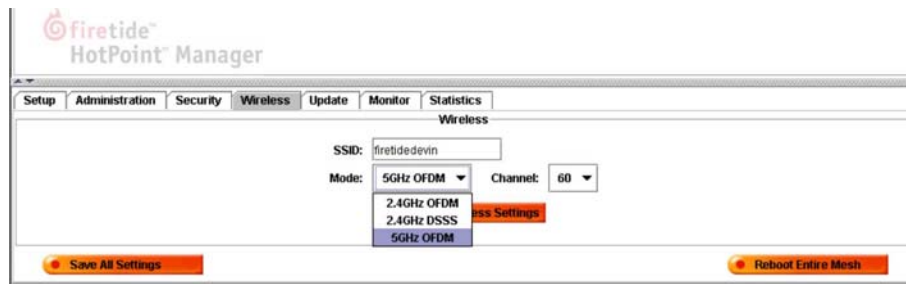
Enabling Single Port Operations

To configure the mesh to utilize a single Ethernet ports use the HotPoint Manager to accomplish this function. By default all ports are enabled, however, overall throughput can be improved with only one Ethernet port enabled.

Remote Management of HotPoint Manager

You can remotely manage the HotPoint manager by utilizing programs such as Remote Desktop/Terminal Services, VNC, Radmin, and pcAnywhere. Refer to the documentation provided by software manufacturer of choice to run and install them. VPN (Virtual Private Network) utilizing PPTP, LPT2 protocols is another way to gain remote access to the mesh.

You will require a workstation connected to the mesh and has another Ethernet connected to the internet. If you have a firewall installed or using NAT (Network Address Translation) you can allow access through the firewall or allow port forwarding to certain a NAT address.

Power Adjustments

The 1500S has the ability to Display/Modify Radio TX Power Level on a per node basis utilizing the HotPoint Manager software. The maximum power (i.e., 100%) is a factory configured value that is unique to each country of operation, each channel of operation, and each antenna configuration and has been determined to be within an authorized limit. This value cannot be changed. However, using the Hotpoint Manager a mesh administrator can set any node to operate at a reduced percentage of this maximum power (e.g. 75%, 50%, or 25%). The administrator can restore the Hotpoint to its approved maximum power by setting the power level back to 100%.

> 📄 **Note: You can only adjust the output power in the following increments 25%, 50%, 75% and 100%. These are adjustments to the node radio, so care must be exercised when adjusting on an existing network as the lowered power level may cause the node to lose connectivity with any other mesh node..**

To view or modify the TX Power right click on the node you want to change the power as indicated in the screen shots below.

For example if the maximum FCC-allowed power output for a certain country, channel, and antenna is 17dBm the settings would be:

100% = 17dBm
 75% = 16dBm
 50% = 14dBm
 25% = 11dBm

> 📄 **Note: Adjusting the power incorrectly could have an adverse effect on proper mesh operations.**

If you are not sure what the power should be adjusted to it is best to leave at default configuration. If you need additional technical assistance, please contact your Firetide dealer.
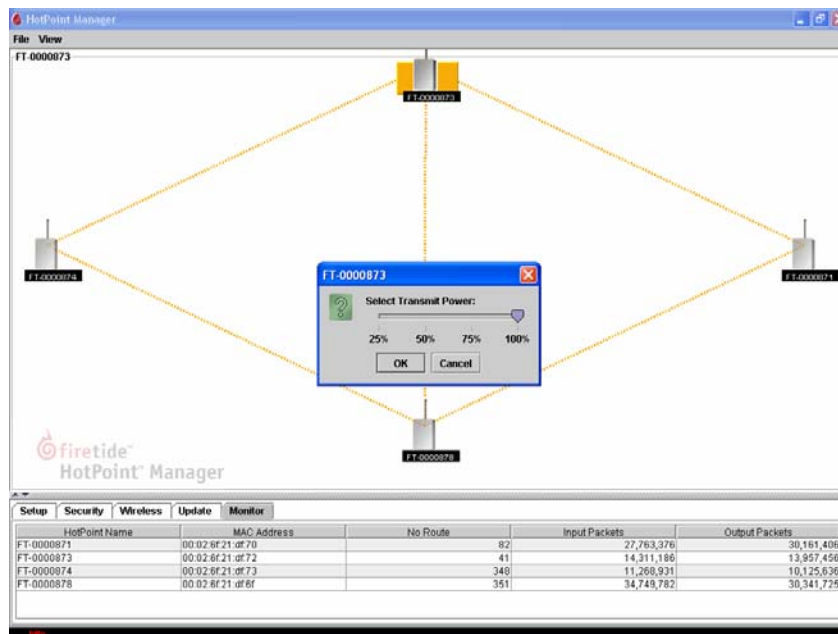
Restoring Default Settings

You can restore to factory default settings for your HotPoint router using the HotPoint Manager software. Refer to the HotPoint Manager User guide for more information. You can also use the following procedure to restore the factory default settings without HotPoint Manager.

1. Unplug the HotPoint power adapter.
2. Connect an Ethernet crossover cable between the following Ethernet ports on the HotPoint mesh router
   - For HotPoint 1000R outdoor mesh routers, connect the crossover cable between both Ethernet ports.
   - For HotPoint 1000S indoor mesh routers, connect the crossover cable between Ethernet ports 2 and 3.

3. Plug in the HotPoint power adapter and wait for red "fault" LED to turn on and then off.
4. The LED will blink 3 more times. Wait three minutes before proceeding to Step 5.

📄 **IMPORTANT: AFTER PLUGGING IN THE POWER ADAPTER, YOU MUST WAIT THREE MINUTES FOR THE UNIT TO RESET ITSELF BEFORE UNPLUGGING IT. If you unplug the power before the unit resets itself, the firmware can be corrupted requiring the unit to be restored at the factory.**

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5. After waiting three minutes, unplug the HotPoint power adapter and disconnect the crossover cable. The default settings are now restored.
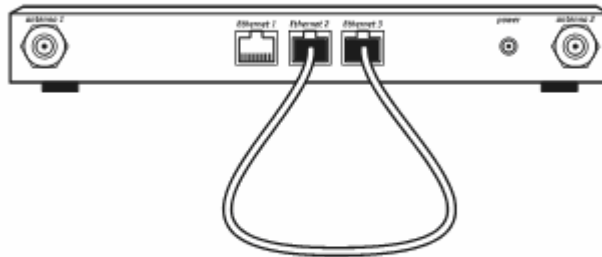
HotPoint 1000S
Connect Ethernet crossover cable to ports 2 and 3.

HotPoint Factory Default Settings
AES Encryption: Disabled
WEP Encryption: Disabled
Mesh IP address: 192.168.224.100
Ethernet ports: All ports enabled
HotPoint Manager username: admin
HotPoint Manager password: admin

A p p e n d i x A - C o n t a c t i n g F i r e t i d e

As a Firetide customer you are entitled to receive free support services on our web site and from your authorized Firetide dealer.

Register with us now to Access our Support Web Site
Registering as a customer on our web site entitles you to free information and materials to help you get the most from your Firetide mesh network. Visit **http://www.firetide.com/support** for information on becoming a registered customer and for access to our support materials.

Dealer Provided Technical Support and Warranty Services
If you need additional technical assistance that is not available on our web site, please contact your Firetide dealer directly. All authorized Firetide dealers are trained and authorized to provide technical support and warranty services for our products and have qualified technical staff available to help you build and maintain your Firetide mesh network.

Product Returns
Please contact your Firetide dealer for instructions on returning defective or damaged products for repair or replacement. Do not return products to Firetide, Inc.

Sales Support
If you need additional HotPoint wireless mesh routers or accessories, please contact your Firetide dealer directly. If you do not know your dealer's name, simply email sales@firetide.com and we will send you the dealer information you need. To help us provide the best service possible, be sure to include your phone number, address and the serial numbers of the HotPoint routers at your location.

A p p e n d i x   B -   T r o u b l e s h o o t i n g

This Appendix will highlight some troubleshooting tips to isolate various types of problems that could occur.

New Installations

Routers missing from the mesh
Make sure you have only a green LED on the enclosure front of the router missing from the mesh. If not check power connections and reset the power.

Connect to the router that is missing from the mesh with HotPoint Network Management to see if you can access it. If you need additional technical assistance contact your Firetide dealer directly.

If you have connection to the router but cannot see the other routers in the mesh then there may be some interference. Interference is defined as the reception of signals from sources other than the intended source. The source of the interference may be from a closer and/or stronger signal level compared to the 1500S signal which will impact the 1500S.   Interference can also be caused by energy that is a completely different frequency from the 1500S. High powered transmitters can radiate "harmonics" which can cause interference. Certain building materials will prevent the signal from reaching other mesh routers. Try relocating the router to another location in the building.

Poor Performance
Poor performance can be caused by interference or other causes. It is best to test performance from within the mesh. Check performance from one router to another rather than choosing a download from the internet. There are many tools that can be utilized and many of them are free such as FTP, IPerf and Qcheck etc. When conducting performance testing connect directly into both 1500S under test to isolate any Access Points or other equipment. If you need additional technical assistance contact your Firetide dealer directly.

Access Devices not working properly
Refer to the access device manual to ensure it is properly configured. The mesh network is designed to be agnostic to devices and traffic. If the mesh network is working then check connectors and access devices. If you need additional technical assistance contact your Firetide dealer directly.

Unable to Ping Mesh Router
Try pinging from another Mesh Router or connect directly into the Router under question and make sure you can connect to that router. If you need additional technical assistance contact your Firetide dealer directly.

Existing Installations

Routers missing from the mesh
Make sure you have only a green LED on the enclosure front of the router missing from the mesh. If not check power connections and reset the power on the enclosure.

Connect to the router that is missing from the mesh with HotPoint Network Management to see if you can access it. If you need additional technical assistance contact your Firetide dealer directly.

If the problem is not hardware related the next step is to check the RF. What has changed in the RF, why did it work before and now it isn't working? Maybe a site survey is required to find out what has changed.

Poor Performance
Poor performance can be caused by interference or other causes. It is best to test performance from within the mesh. Check performance from one router to another rather than choosing a download from the internet. There are many tools that can be utilized and many of them are free such as FTP, IPerf and Qcheck etc. When conducting performance testing connect directly into both 1500S under test to isolate any Access Points or other equipment. If you need additional technical assistance contact your Firetide dealer directly.

Unable to Ping Mesh Router
Try pinging from another Mesh Router or connect directly into the Router under question and make sure you can connect to that router. If you need additional technical assistance contact your Firetide dealer directly.

No Routes when Utilizing HotPoint Manager
Verify the neighbor count and if it exceeds 15 neighbors then you may need to add another unit to give the mesh alternate paths.

A p p e n d i x   C -   R e g u l a t o r y   N o t i c e s

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

Note
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/television technician for help.

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.

FCC Radiation Exposure Statement
The antenna used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter. OEM Integrators, end-users and installers must be provided with antenna installation instructions and transmitter operating conditions for satisfying RF exposure compliance.

A p p e n d i x   C -   S p e c i f i c a t i o n s

Specifications

Product Ordering Codes
HotPoint 1500S (5GHz)
1500S-0101 NAM (Canada/US)

Protocol
Firetide Mesh Routing Protocol (FMRP)

Encryption
- AES, RSA certificates
- 128 bit WEP
- Port-to-port 128bit AES

Wireless interface
- 2.41 – 2.46 GHz
- 5.15 – 5.25 GHz
- 5.25 – 5.35 GHz
- 5.75 – 5.825 GHz
- Radio TX Power: Maximum 100mW
- Certified Regions of Operation
    - Contact your local dealer

Network ports
- Three Auto-sensing 10/100 Ethernet ports (IEEE 802.3, 802.3u)

Enclosure
- Two Antenna connectors (SMA Reverse Polarity)
- One Power Connector
- Three Ethernet data connectors (RJ-45)
- Indicator LEDs (power, activity, fault)
- Wall mounting brackets
- Weight: 1.75 lbs (0.8Kg)

Antennas
- Two Antenna connectors (SMA Reverse Polarity)
- Two Omni, Vertical Polarization
    - 5"(12.9 cm) black, rubberized paddle
    - Range: 0.2 Miles (300 Meters)
    - Gain: 4.5dB

Dimensions
- 9" x 5.9" x 1.1" (22.8 cm x 15 cm x 2.2 cm)

Power
- 110/220 VAC, 50/60 Hz
- 12 W power consumption

Regulatory Agency Certifications
- FCC CFR47 Part 15, Class B
- FCC CFR47 Part 15, Class B
- OET-65C,

Environmental specifications
- Operating temperature: 0° C to $+60^o$ C
- Storage temperature: -20° C to $+80^o$ C
- Humidity (non-condensing) 10% to 90%
- Storage Humidity (non-condensing): 10% to 90%

Warranty
One year (limited)