firetide®
A Division of UNICOM® Global

HotPoint™ Hardware Installation Guide

HotPoint 5200 Access Point

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About this document

This section lists the audience, purpose, and conventions used in this document.

Audience

This document is intended for qualified installers and administrators of Firetide products.

Purpose

This document has the information necessary to configure, install, and do basic troubleshooting for HotPoint 5200 access points.

Conventions

Certain information has special meaning for the reader. This information appears with an icon that indicates a particular condition, such as a warning or caution, or a label, such as "Note" or "Best Practice".

Electrical hazards are those environments where the danger of electrocution is probable. This image appears before each electrical hazard statement.

Warnings contain safety information that you must obey. If you do not obey the instruction in a warning, the result might include serious injury or death. This image appears before each warning statement.

Cautions contain information that you should obey to avoid minor injury, inconvenience, and damage to equipment. This image appears before each caution statement.

Notes contain optional advice and information particular to a special case or application.

Best practices contain specific recommendations based on industry-standard expectations.

Document feedback

If you find an error or content missing from this document, we want to hear about it. You can send your feedback about any of our documents to techpubs@firetide.com.

Contacting customer support

If you need support, depending on the problem, you might be asked for this information:

- Description of the problem
- Computer with HotView Pro and an installed management license
- Channel and frequency plans
- Recent spectrum analysis
- Device topology in Google Earth (KMZ file)
- Network map or topology plan with the names and device information

You must also have administrator access to the mesh to be able to receive technical support.

The next table lists the contact information for customer support.

Worldwide customer support	Days/Hours	Contact
Americas	Monday to Friday 7:00 am to 5:30 pm PST (Pacific standard time)	http://www.firetide.com/requestsupport 1 (877) FIRETIDE, extension 2 +1 (408) 399-7771, extension 2 +1 (408) 355-7271
Africa Asia Australia Europe	Monday to Friday 8:00 am to 5:30 pm IST (India standard time)	http://www.firetide.com/requestsupport +918040215111 Fax +1(408) 317-2257

Contents

HotPoint 5200 access point overview

The Firetide HotPoint 5200 wireless MIMO access point is a standalone access solution for outdoor use. This section explains the hardware features of the access point and management options.

Hardware features

The HotPoint 5200 access point is a standalone access point. Standalone devices do not require any other network device or equipment to configure or manage them. Each access point, with its antennas, is a complete system for wireless access service delivery.

The next figure shows the HotPoint 5200 access point correctly oriented for installation to a pole or mast.

In locations where access to Ethernet or power is limited, the access point can receive Power over Ethernet (PoE).

Caution! A HotPort 7020 cannot supply power to a HotPoint 5200 access point.

The HotPoint 5200 access point has a UL2043 plenum-rated enclosure and has these hardware features:

- An RJ-45 connector for attaching to a Firetide HotPort wireless mesh node or a conventional Ethernet port
- Two radios (Radio 1 operates in the 2.4 GHz band and Radio 2 operates in the 5 GHz band)

- LEDs
  - 2.4 GHz
  - 5 GHz
  - Power

Management options

You can choose to manage HotPoint access points in one of these ways:

- Web user interface
- HotView Pro network management software release 10.15.0.0 and later

Web interface

The web (HTTP) interface is a management interface that comes with each access point. With this software you can configure each access point individually through a browser. This method is good for small networks with few devices.

HotView Pro

HotView Pro is a robust network management software (NMS). It lets you manage many Firetide devices at the same time. To use HotView Pro you need to purchase one management license for each access point.

Optional accessories

These accessories are available for purchase:

- 2.4 GHz, 8 dBi omni-directional 3x3 MIMO antenna (AO-024-MIMO-8)
- 5 GHz, 8 dBi omni-directional 3 x 3 MIMO antenna (A0-050-MIMO-9)
- LMR400 cable with low loss lightning suppressors
  - 1.5 m length
  - 5 m length

Note. For more information about these and other accessories, see the *Firetide Antenna, Cables and Accessories Guide*.

Power Consumption table

Power input from DC supply: 33 W (Typical), 33 W (Max)

Power input from PoE: 23 (Typical), 26 W (Max)

HotPoint 5200 access point setup

Before you install an access point outside, you need to make sure:

- The parts are all in the box.
- Attach the cables and antennas for testing.
- Make an initial connection from a laptop that is running the web interface or HotView Pro so you can make sure the device works as expected.

Verifying the box contents

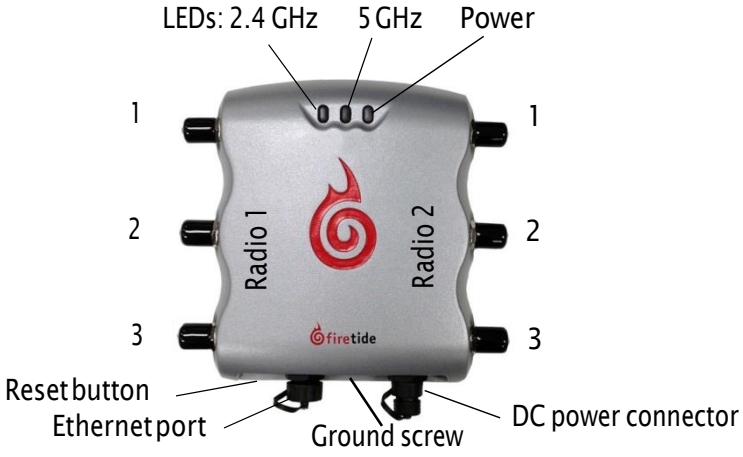
The box contains these items:

- One HotPoint 5200 access point
- One power cable (USA type)
- One Power over Ethernet (PoE) injector
- Six dual-band 2.4 GHz and 5 GHz, 3 dBi omni-directional staging antennas
- Six SMA to type-N plug adapters
- One Ethernet cable
- One field-installable Ethernet connector
- Mount kit
- Quick Start Guide

If any of these items is missing from the box, call your reseller for help.

Parts of a HotPoint access point

The next picture shows the radios, LEDs and connectors on the access point.

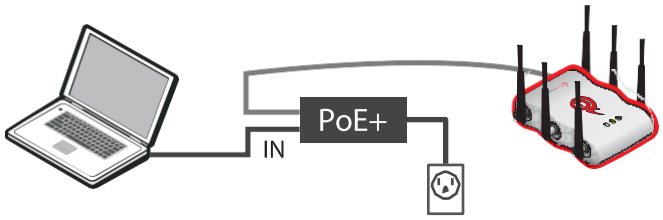


Attaching cables and connectors

Before you install the device in a permanent location, assemble the device completely and verify that the LEDs come on.

To assemble the access point for configuration and testing:

1. Put an adapter on the end of each staging antenna.
2. Remove and discard the rubber protective covers on the antenna connectors.
3. Attach one staging antenna assembly to each antenna connector.
4. Bend the staging antennas at the joints. Refer to the next diagram.
5. Connect the PoE injector assembly to the access point and the administrator's computer.
   - Attach one Ethernet cable from the Ethernet port of the access point to the OUT port of the PoE injector.
   - Attach another Ethernet cable from the administrator's computer to the IN port of the PoE injector.
   - (Optional) Attach the power cable to a power source.



Connecting a computer to a new access point

You need to change the TCP/IP4 settings on your computer so that you can communicate with the access point. The first time you connect to the access point, you need to change the TCP/IP4 setting on your computer.

Note: If you are using PoE, connect your computer directly to the IN port on the POE injector.

192.168.224.160 is the default IP address of the access point.

To connect to an access point for the first time:

1. Attach the Ethernet cable from the Ethernet port on the access point to an Ethernet port on the administrator computer.
2. Supply power to the access point.

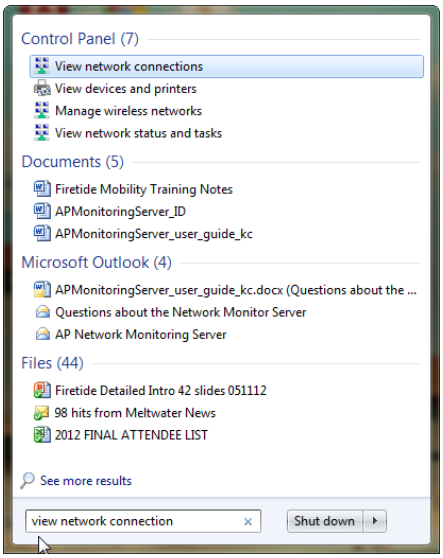
   If you are using PoE, the access point receives power from your computer.

   The access point boots in 1.5 to 2 minutes. The power LED glows steady.

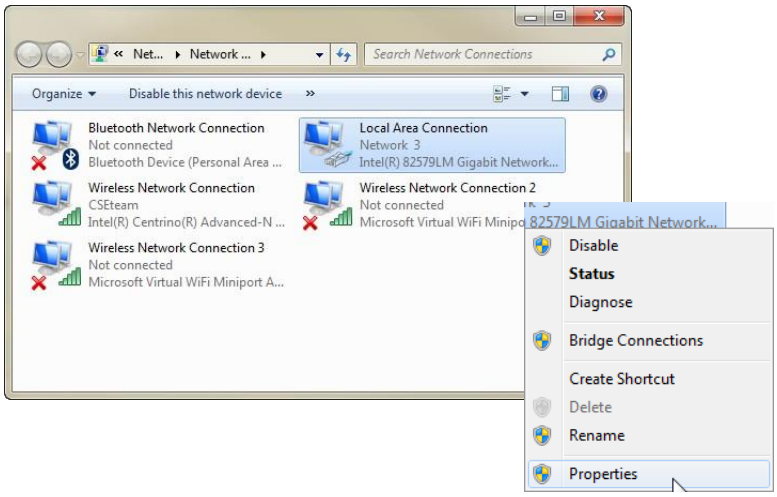
From the computer connected to the access point, do the steps for your operating system.

Windows 7 users:

a. Go to Start, and then in the search box, enter "View Network Connections".

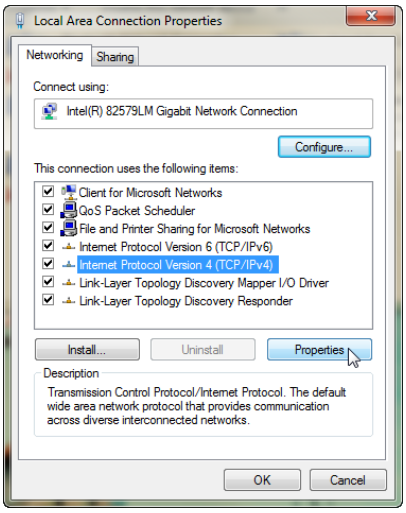


b. Right-click **Local Area Connection > Properties**



c. From the Networking tab, select TCP/IP4.

d. Click **Properties**.



Windows XP users:

a. Go to **Start > Connect To > Show all connections**
b. Right-click Local Area Connection and select **Properties**.
c. Select Internet Protocol, and then click **Properties**.

Windows 8 users:

a. Go to **Network and Internet > Network Connections**
b. Right-click **Wired Ethernet Connection > Properties**
c. Select Internet Protocol Version 4, and then click **Properties**.

Windows Vista:

a. Go to **Start > Control Panel > Network and Sharing Center** (Classic View) **> Manage network connections**
b. Right-click **Local Area Connections** and select **Properties**.
c. Select Internet Protocol Version 4 (TCP/IPv4) and select **Properties**.

3. Enter an IP address/subnet mask for your computer of the format 192.168.224.xxx (where xxx is an address on the same subnet as the access point), and then click **Apply**.

Caution! Do not use 192.168.224.160. It is the default address of the access point.

4. From a command prompt window, ping the access point to verify connectivity.

   ping 192.168.224.160

   The access point is ready to be configured. You can load the access point into HotView Pro to configure it or you can use the embedded web interface. This guide contains procedures with the web interface. For HotView Pro software procedures, refer to the *HotPoint Access Point Configuration Guide*.

LEDs

HotPoint 5200 access points have three LEDs:

- Power
- 2.4GHz radio
- 5GHz radio

LED boot operation

During boot up, LEDs operate in this order:

1. All LEDs come on for 5 seconds.
2. The 5GHz radio LED goes off.
3. The 5GHz radio LED comes on again after 5 seconds. This action shows that the LED driver started.
4. After 15 seconds, the 2.4 GHz and 5GHz radio LEDs go off. This shows that the system is ready.

LED operation during client association and data traffic

During client association and data traffic, LEDs operate this way:

- When clients associate, the appropriate radio LED comes on.
- After the LED is on, the appropriate LED blinks to indicate the date rate.
- When no clients are available, the radio LED stays off.

LED operation during a firmware upgrade

During a firmware upgrade, the 2.4GHz radio LED blinks quickly.

Radios

By default, Radio 1 operates in the 2.4 GHz band, and Radio 2 operates in the 5 GHz band.

Ground screw

The ground screw is between the Ethernet and power connectors.

Outdoor device installation

The process for HotPoint 5200 access point installation to a permanent outdoor location is:

1. Survey the site:
   - Look over the entire site before you install any equipment.
   - Identify possible hazards.
2. (Optional) Install the components to a mast or pole that you will install as an assembly at the installation site.
3. Install the access point to a pole or wall.
4. Attach the antenna.
5. Ground the access point.
6. Weather proof all connections.
7. Supply power to the access point.

Caution! A HotPort 7020 cannot supply power to a HotPoint 5200 access point.

8. Make sure you can connect to the wireless LAN or Internet.

Warning! Qualified professionals must install HotPoint 5200 access points. Failure to install this equipment properly can result in equipment damage, personal injury, or death.

Electrical shock hazard warning! This device connects to non-insulated voltages of sufficient magnitude to be a risk of lethal electric shock to persons.

Warning! Do not install Firetide products where possible contact with power lines can be made. Antennas, poles, towers, guy wires, or cables can lean or fall and contact these lines. People can be injured or killed if they are touching or holding any part of the equipment when it contacts electric lines. Make sure that equipment and personnel cannot directly or indirectly contact power lines.

Safe installation practices

Best practice: Install HotPoint 5200 access points on poles that are a sufficient distance from 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 distance ensures that the pole will not contact the power line if it falls during or after installation.

- Select equipment locations that allow safe and simple installation.
- Do not work alone.
- 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, do not catch it.
- If a wire or pole touches a power line, do not touch it.
- Do not install antennas or towers on windy days.
- Make sure all towers and poles are securely grounded. Make sure all electrical cables connected to antennas have lightning arrestors.

  A connection to earth ground and a lightning arrestor can prevent fire damage or personal injury in case of lightning, static build-up, or short circuit within the equipment connected to the antenna. The HotPoint 5200 access point has lightning protection. Make sure that all equipment connected to the HotPoint 5200 access point has the same level of protection.
- Use 10 AWG ground wire and corrosion-resistant connectors to connect the base of the antenna pole or tower directly to the building protective ground or to one or more approved grounding rods.
- Refer to the National Electrical Code for grounding guidance.

Preparing earth ground

Warning. A HotPoint access point (node) must be correctly connected to earth ground. Failure to do so can result in equipment damage, injury, or death.

The product warranty does not include damage from incorrect grounding. Obey all local building and electrical codes regarding antennas. If not available, refer to the National Electric Code (NEC).

Earth grounding guidelines include:

- If you attach a node and antenna to a tower or pole, attach the base of the tower pole to the building's ground or to one or more approved grounding rods with 10 AWG ground wire and corrosion-resistant connectors.
- Connect the grounding cable to rain gutters only if the rain gutter is connected to earth ground.
- Ground rods are copper-plated and 1.8 to 2.4 meters (6 to 8 feet) long.
- Install all ground components in straight lines. If you must make a bend, do not make a sharp bend.

- Earth-to-ground should be less than or equal to 10 ohms.
- Some salt compounds are corrosive and can cause copper ground rods to corrode.

To prepare the soil for ground rods:

1. If the soil contains rocks or sand, insert the ground rods into the ground.
2. Pull out the ground rods.
3. Put in an approved ground enhancement material into the holes where the grounding rods go.
4. Put in the ground rods.

Grounding a HotPoint access point

The certified installer is responsible for the calculation of the correct gauge of the wire to be used to ground a HotPoint access point (node).

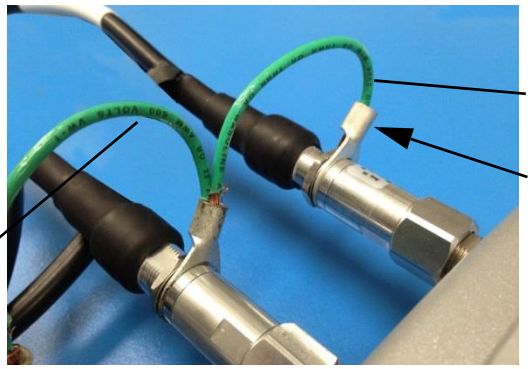
Caution. If the structure to which the node is attached is not properly grounded, the node can be damaged by a power surge.

To ground a node:

1. Calculate the correct gauge of wire to be used in this procedure. Refer to the National Electrical Code for grounding information.

   Caution. The certified installer is responsible for the correct calculation of the wire gauge and other accessories that might be required to ensure proper earth ground.

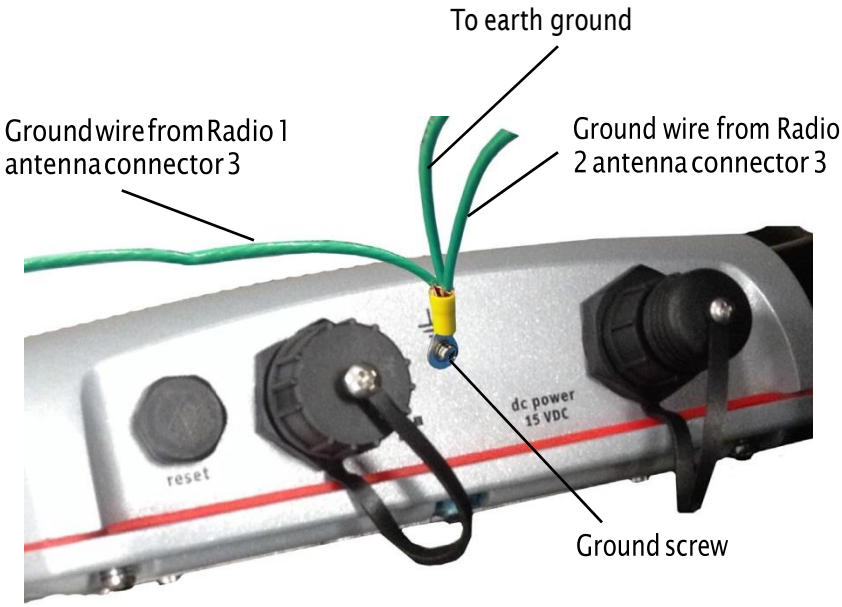
2. Terminate all antenna connectors. See the next picture.
   a. Cut three correct lengths of the correct gauge of wire.
   b. Attach the terminal lug and 50 Ohm antenna terminator to each of the three antenna connectors.
   c. Attach the antenna cable.
   d. Insert the wires to the antenna connectors as shown in the next picture.
   e. Crimp the lug that holds with the wire for antenna connector 1.
   f. Crimp the lug that holds the wire from antenna connectors 1 and 2.
   g. Crimp the lug that holds the wire from antenna connectors 2 and 3.



h. Repeat for second radio (if present).

i. If you are not using Radio 2, terminate all three antenna connectors with 50 Ohm terminators.

3. Remove the ground screw from the bottom panel.
4. Insert the ground lug for the enclosure.
5. Tighten the ground screw to secure the ground lug to the node.



6. Crimp the lug that holds the wire from antenna connector 3 and the enclosure.

Caution! The wire in this picture might not be the correct gauge for your application. Consult a certified installer for grounding materials for your application.

Now you are ready to weatherproof the cable connections.

Required tools

Common tools used for installations include:

- 1/2-inch open-end wrench
- 7/16-in open-end wrench
- 3/8-inch open-end wrench
- Phillips screwdriver
- Channel-lock or slip-joint pliers
- RJ-45 crimping tool and male plug
- Waterproofing tape or butyl mastic to weatherproof connections

Preparing the access point for outdoor installation

This section contains the optional procedure for installations that require the access point and other accessories to be attached to a separate mast or pole before transportation to the outdoor site.

Warning! Only use antennas that are rated for outdoor applications.

Warning! Failure to comply with these installation instructions might result in severe personal injury including electrical shock or permanent damage to equipment.

Warning! Make sure that all safety equipment is in good condition. Do not use broken or damaged tools or equipment. Always use safe work practices and obey all local and national guidance for earth ground requirements and electricity.

Note: Collect all tools before you install the access point.

1. To a pole that you can install at a permanent outdoor site, attach these items:
   - U-bolts and mount plate for the access point
   - Antennas
   - PoE injector

   Caution! The PoE injector is not weatherproof. Do not expose it to rain or direct sunlight.

   - Any other accessories, such as an enclosure for the PoE injector, that needs to go on the pole or mast
2. Use the hooks on the back of the access point to attach it to the mount plate.
3. Plan to ground the assembly on site.

   Caution! The assembly must be grounded. If the mast is not already sufficiently grounded, you need appropriate grounding hardware. Consult local codes.

4. Take the assembly to the installation site.

Checking the outdoor environment for safety

Caution! Do not install this product on a windy or rainy day.

Check to make sure that any changes to the site conditions will not negatively affect the installation or personal safety.

Install the access point in a permanent outdoor location

1. Use the correct safety equipment to install the access point in its permanent outdoor location:
   - Install a lightning suppressor.
   - Install all grounding equipment.
   - Use weatherproofing on all cables
2. Attach the Power over Ethernet assembly to power the device.
   a. Put the correct end of the power cable into the PoE injector.
   b. Put the plug end of the power cord into a grounded AC power source.
   c. Attach an Ethernet cable from the wireless mesh node to the IN port.
   d. Attach an Ethernet cable from the OUT port to the Ethernet connector of the access point.
3. Optionally, use plastic tie wraps to keep the cables tidy.
4. Give the access point power. If PoE is connected correctly, the LEDs on the PoE injector glow.
5. Put weatherproofing around the PoE connection.

Caution! The PoE injector is not for outdoor use.

6. Verify that the access point works:
   - Ping the IP address
   - Open the Web interface

Installing a HotPort 5200 access point to a pole or wall

The HotPort 5200 access point has a two-piece mount assembly:

- One half of the mount assembly permanently attaches to a pole or wall
- The second half, attached to the back of the access point, hooks over the first half.

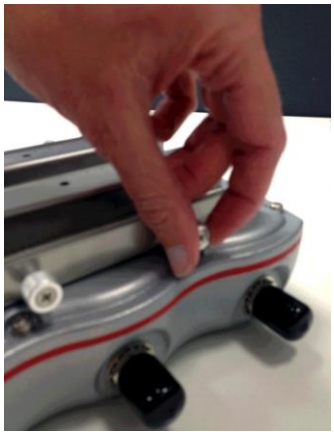
Required tools: Phillips screwdriver

Note. To install an access point to a wall, you need to supply the correct fasteners for the type of masonry.

The HotPoint 5200 comes with a two-piece mounting plate already attached.

To remove the mount plate that attaches to a pole or wall:

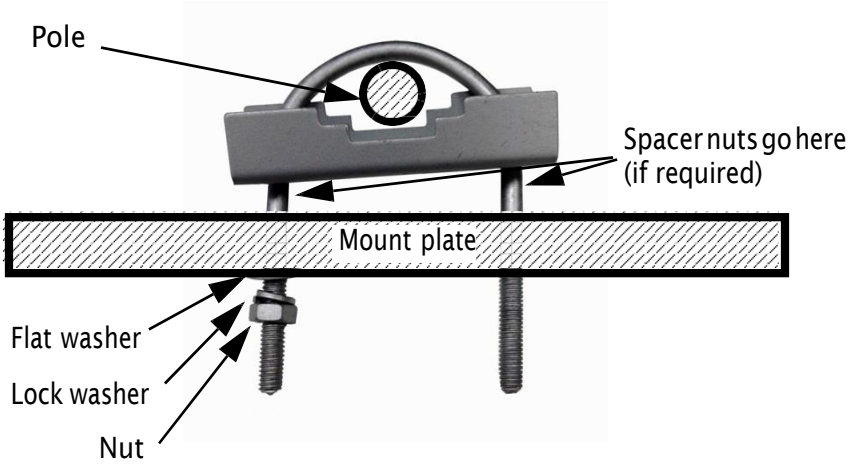
1. Use your fingers or a Phillips screwdriver to loosen the four captive screws (two on each side).



2. Remove the hook attachment plate.

3. Attach two U-bolt assemblies around the mounting pole. The U-bolts are large enough to accommodate large poles. The next figure is a top view of a pole and mount plate and the hardware for one side of the U-bolt. Put the hardware on both sides of the U-bolt.

Note: If you install the access point to a small-diameter pole, you must either cut the U-bolts to length or use four additional spacer nuts (not included).



4. Hang the access point on the bracket.
5. Tighten the four captive screws.

Antennas for outdoor use

For descriptions of antennas approved for use with HotPoint access points, refer to the *Firetide Antenna and Accessory Guide*.

Attaching an antenna

The mounting system consists of a pole clamp assembly, a pivot link, and an antenna bracket.

Required materials: flat washers and lock washers

To attach an antenna to a mast:

1. Attach the pivot link to the pole clamp assembly. Put a flat washer under the bolt head. Under the nut put a flat washer and lock washer.
2. Attach the pole clamp assembly to the pole. Put a flat washer under the bolt heads, and under the nuts put a flat washer and lock washer.
3. Attach the antenna bracket to the antenna so that the mounting lug is horizontal when the top of the antenna is up.
4. Make sure the polarizations of the antenna is the same between the two ends of the link.

Connecting antennas

Antennas are not included with the purchase of a HotPort 5200. This section describes the common steps to attach an antenna cable to an access point.

Firetide sells antenna cables with or without integrated lightning arrestors.

Unused antenna connectors must be terminated with 50 Ohm terminators (not included).

To connect antennas with integrated lightning arrestors to a HotPoint 5200 access point:

1. Remove and discard all six rubber antenna connector covers.
2. Attach the lightning arrestor-side of the cable to the Radio 1 side (left) of the access point.
   - For a MIMO antenna cable, use all three antenna connectors.
   - For an OFDM antenna cable, attach the lightning arrestor to antenna connector 1.
3. Repeat step 2 for Radio 2 (right).
4. If any antenna connectors are not connected to a lightning arrestor, install a 50 Ohm terminator to each uncovered antenna connector.

You are ready to weatherproof all of the connections. See "Weatherproof procedures" on page 17.

Recommendations for indoor use

If you intend to use the HotPoint 5200 access point inside a building, such as a warehouse, you need to use special pigtails.

Recommendations for corrosive environments

If you install a HotPoint 5200 access point in a corrosive environment, you must use rust-proof screws. If you do not use rust-proof screws, you must use extra strapping or rust-proof safety chains.

Weatherproof procedures

Cable connections become loose over time due to vibration. Loose connections let moisture contact and erode the interface to a connector. To avoid performance problems due to moisture damage, Firetide recommends that you use butyl mastic and electrical tape or silicone tape to make all outdoor connections weatherproof.

The next picture shows where the weatherproofing needs to go on a HotPoint 5200 access point.

Put weatherproofing where...

- lightning arrestor and mesh node meet
- lightning arrestor antenna cable meet

Best practice: You can use colored tape for easy identification of the connectors from the mesh node to the antenna.

Butyl mastic is a synthetic rubber sealant that you can use to make a connection weatherproof. It is slightly sticky and stays flexible; it bonds to itself to make a good seal. Butyl mastic and a layer of electrical tape keeps the cable assembly clean, dry, and easy to change in the future.

Note: To make a strong watertight connection, keep a high level of tension in the butyl mastic when you stretch it over the cable and connector.

Tools and materials to weatherproof connections

To make a weatherproof connection you need the following tools and materials:

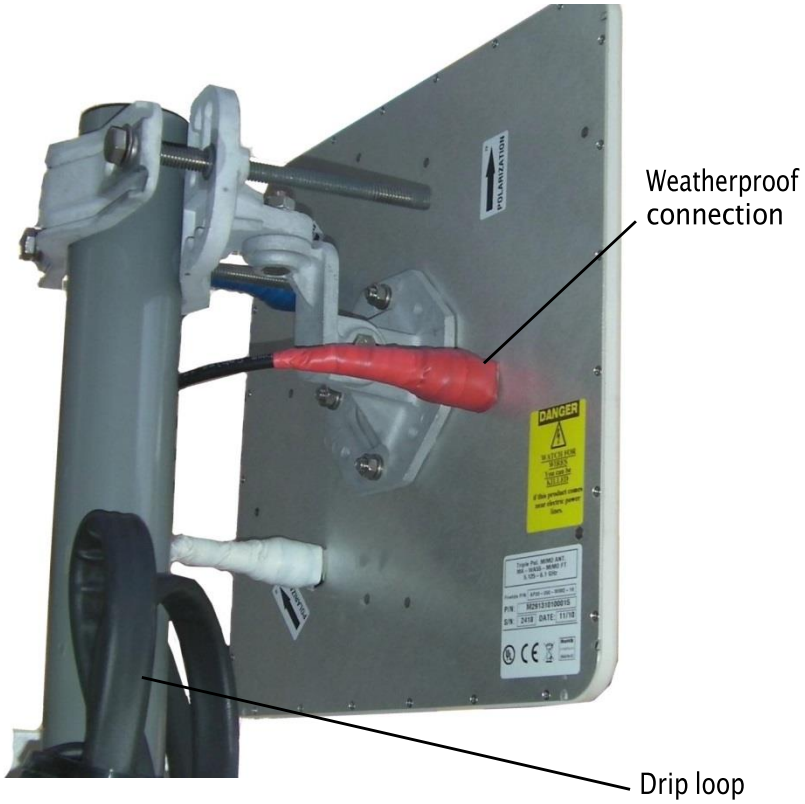
- Pliers
- Utility knife
- Vinyl electrical tape

Note: Vinyl electrical tape between the cable assembly and the mastic tape makes future changes easier than mastic tape put directly on the cable. Vinyl electrical tape as a cover over the mastic tape prevents the mastic from melting in hot weather.

- Rubber splicing or mastic tape (also known as self-amalgamating, self-sealing, self-fusing, non-vulcanized tape)
- Pencil or wooden dowel for small clearances
- Cleaning supplies (if necessary)
- Laptop running HotView software

Making a weatherproof antenna connection

You need to put tape around the antenna connectors to make them weatherproof. The next picture shows correct tape technique and a drip loop.



To make a weatherproof antenna connection:

1. Gather the tools and materials to do the procedure.
2. Ensure that the cable and connector is clean. Clean off oil, water, grease, and dirt.
3. Attach the cable connector to the antenna connector, and then use pliers to tighten the connection.
4. With a computer running HotView Pro, make sure that the Firetide device works.
5. Wrap a layer of electrical tape (sticky side out) over the connector from the end to approximately 2.5 cm (1 inch) of cable. Overlap the tape by 40% with each turn.

Note: Wrap the electrical tape on a pencil or wooden dowel when you have little clearance.

Note: To make a strong watertight connection, keep a high level of tension in the butyl mastic when you stretch it over the cable and connector.

6. Tightly wrap a layer of mastic tape over the electrical tape.

7. Wrap a layer of electrical tape (smooth side out, sticky side in) over the mastic tape. Make a 40% overlap on each turn. Start from the base of the unit to at least 2.5 cm (1 inch) of the cable.

8. Wrap a second layer of electrical tape over the first layer of electrical tape.

The antenna connector is weatherproof.

Making a weatherproof cable to node connection

You need to make two connections weatherproof:

- From the antenna cable to the lightning arrestor
- From the lightning arrestor to the node

To make a weatherproof cable to node connection:

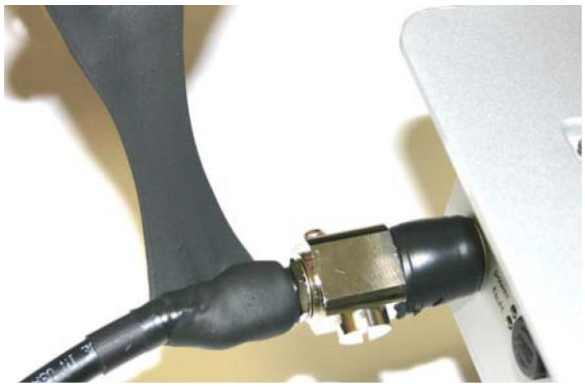
1. Gather the tools and materials to do the procedure.
2. Ensure that the cable and connectors are clean. Clean off oil, water, grease, and dirt.

3. Wrap a layer of electrical tape (sticky side out) over the arrestor to node connector and wrap approximately 2.5 cm (1 inch) of cable. Overlap the tape by 40% with each turn.

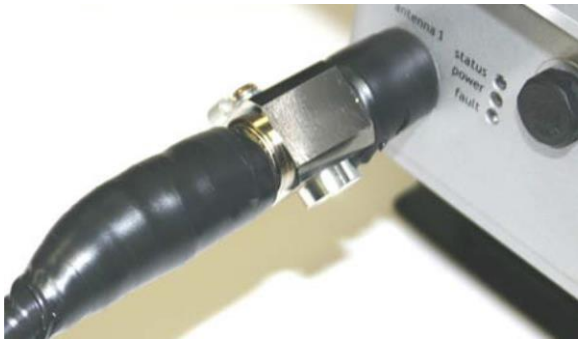
4. Repeat for the antenna cable to arrestor connection.

Note: To make a strong watertight connection, keep a high level of tension in the butyl mastic when you stretch it over the cable and connector.

5. Tightly wrap a layer of mastic tape over the electrical tape. Make a 40% overlap on each turn. Start from the base of the unit to at least 2.5 cm (1 inch) of the cable.



6. Wrap a layer of electrical tape (smooth side out, sticky side in) over the mastic tape.



7. Wrap a second layer of electrical tape over the first layer of electrical tape.

The lightning arrestor connections are ready for installation in an outdoor environment.

Troubleshooting

This section contains troubleshooting information.

Resetting an outdoor node to factory default settings

Do a reset when you:

- Remove a device from the field
- Forget the access credential (password)
- Cannot communicate with a device

Caution! When a HotPort 5200 access point is reset, configuration information is erased.
Exception: The system does not erase the USA (840 and 842) country codes.

To do a software reset with HotView Pro software:

1. Right-click the access point > **Factory reset this HotPoint**
2. When the confirmation message appears, click **Yes.**

For a hardware reset you need:

- Paper clip, stiff wire, or thin piece of plastic or wood
- Computer with HotView Pro
- Ethernet cable
- Screwdriver or adjustable wrench (depends on model of node)

To do a hardware reset for an outdoor node:

1. Supply power to the node.
   The power LED comes on. After one minute, the node is ready to be reset.
2. Do the step correct for the model of node:
   - If the node has a reset screw, use a screwdriver to remove the screw.
   - If the node has a pressure valve, use your fingers or adjustable wrench to remove the valve.
3. Put the screw or valve in a safe place until you finish this procedure.
4. Press and hold for 20 seconds the reset button with the paper clip or other tool.
5. Wait one minute, and then log in with HotView Pro or web interface.
6. Configure the node or apply a previously saved configuration file.
7. Replace the screw or valve that covers the reset button.

Improving client experience and device performance

If the access point disconnects clients repeatedly, change the RTS/CTS value to 128.

To improve device performance, assign specific channels to the access point. Do not use the automatic channel selection feature (auto).