HotPort

Firetide Installation Guide
HotPort 5020 Edge Nodes

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Firetide, Inc.

2105 S. Bascom Avenue, Suite 220
Campbell, CA 95008
USA

www.firetide.com

About this document

This section lists the audience, purpose, summary of information, and conventions used in this document. It also includes how to contact customer service.

Audience

This document is intended for certified professionals who install Firetide wireless solutions.

Purpose

This document has the information and procedures necessary to install and do basic configuration and tests with Firetide 5020 edge nodes.

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. An 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. An image appears before each warning statement.

Cautions contain information that you should obey to avoid minor injury, inconvenience, and damage to equipment. An 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 +91 80 40215111 Fax +1(408) 317-2257

Contents

HotPort 5020 edge nodes

HotPort 5020 edge nodes are a cost-effective way to extend a mesh network. Edge node models include:

· HotPort 5020-E node

HotPort 5020-E node

The HotPort 5020-E node has one radio to extend the edge of a mesh network with a single 25 Mbps data link.

The next image shows three HotPort 7020 mesh nodes with one HotPort 5020-E node. The HotPort 7020 mesh nodes join together to make a core network. The HotPort 5020-E node attaches to one HotPort 7020 mesh node at the edge of the core network to extend the network with one 25 Mbps link. The devices connect to the HotPort 5020-E node over the Ethernet port.
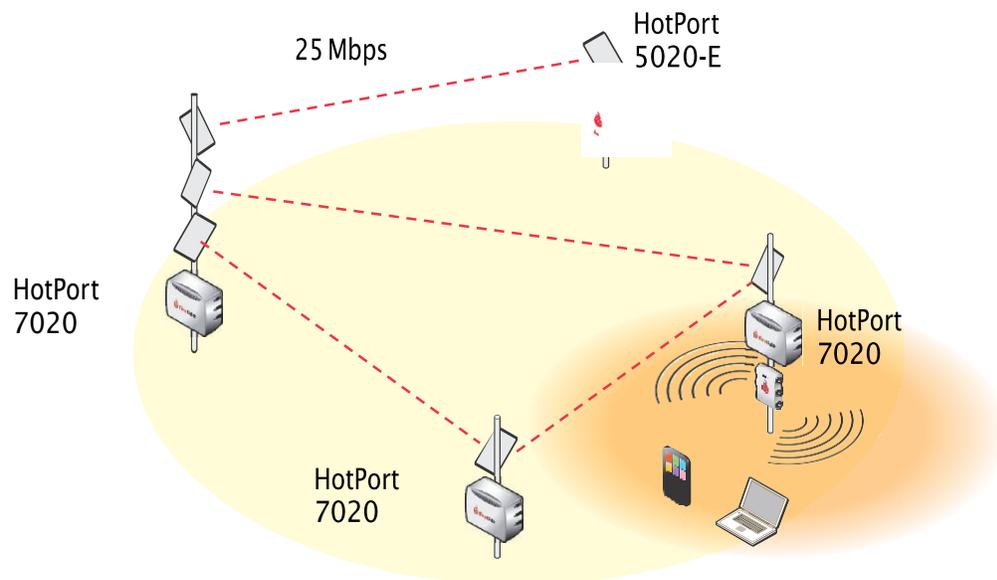
Edge node compatibility

HotPort 5020 edge nodes are lightweight, outdoor devices that are compatible with these Firetide products:

- HotPort 7010/7020 mesh nodes with 7.15.0.0 or later firmware

Note: Mesh nodes with a 900 MHz radio must have a different firmware.

- HotPoint 5100/5200 access points with 5.55.0.0 or later firmware
- HotView Pro 10.15.0.0 and later

HotPort 5020 edge nodes come in two models:

- HotPort 5020-E extends data connectivity in a mesh network
- HotPort 5020 edge nodes come with 7.15.0.0 or later firmware installed.

Edge node behavior

Edge nodes extend the edge of a static network.

Edge nodes work in network environments:

- With or without security enabled. The link performs up to 25 Mbps in either environment.

Note. HotPort 5020 edge nodes do not connect to mobile nodes and are not supported in mobility applications.

Product comparison

The next table shows the HotPort 5020 edge node and HotPort 7020 mesh node feature support and capabilities.

Feature	HotPort 5020-E edge node	HotPort 7020 mesh node
Network topology support	Purpose-specific uses by model: · 5020-E extends the mesh in point-to-point and point-to-multipoint networks	Flexible platform that supports: · Point to point · Point to multipoint · Infrastructure mesh
Suggested applications	· Sensor backhaul · ITS · Wi-Fi service · Base station backhaul · Cellular offload · Smart meters	· Video applications and backhaul · Large scale installations · Mobility
Node modes	HotPort edge nodes do not support gateway server, gateway interface, and mobile modes. They behave differently from mesh nodes.	· Gateway server node · Gateway interface node · Mesh node · Mobile node
Ethernet ports	One GigE port (10/100/1000 Mbps)	Four GigE ports
UDP throughput	25 Mbps	300 Mbps (with dual radio license)
Latency	Less than 1 millisecond	Less than 1 millisecond
Ethernet Direct	No	Yes
Maximum hops	One hop to 7010/7020	Up to 15 hops without fiber
Management	HotView Pro 10.15.0.0	HotView Pro 10.15.0.0
License support	· No additional radio licenses are required. · A device management license must be installed.	· MIMO · Mobility · Dual radio license (required to use the second radio) · A device management license must be installed.
Weight	1.1 kg (3.8 pounds) includes bracket	5.4 kg (11.9 pounds) includes bracket and shield
Dimensions	210 mm x 198 mm x 60 mm (8.27 inches x 7.8 inches x 2.36 inches)	294 mm x 206 mm x 104 mm (11.6 inches x 8.1 inches x 4.1 inches)

Before you permanently install

Before you install a node in a permanent location, you need to make sure you have all of the correct components and make sure the components are operational.

Preparing what you need to install

To get what you need to set up a node:

1. Open the box.
2. Remove the contents.
3. Check the contents for damage.

   If a part is missing or damaged, call your Firetide reseller.

4. If the contents are good and correct, keep the box for future use.

Box contents for a HotPort 5020-E node

The HotPort 5020-E node box contains these items:

- HotPort edge node in a NEMA-4X enclosure and an assembled mount bracket
- One 3 dBi omni-directional staging antenna

> ⚠ **Caution.** Do not use staging antennas outdoors. The staging antennas are rated for indoor use only and are recommended for pre-configuration purposes only. If you use the staging antennas outdoors, they can be damaged. Damage from incorrect deployment is not covered by the product warranty.

- One reverse-polarity SMA to type N plug adapter
- Mount kit
    - U-bolts, M6x1.0-80mm, with flat washers, split washers, nuts
    - Claw-tooth pole grippers
        - M6x1.0-40mm hex bolt
        - M6x1.0-20mm hex bolt
    - Hex-head socket wrench
- One PoE+ injector

- One AC power cable (USA type)

Note. Other IEC cords are available separately.

- One DC power connector (field installable)
- One weatherized Ethernet RJ-45 connector (field installable)
- One Ethernet cable (shielded Cat5e)
- Quick start sheet
- Warranty card

Parts of an edge node

The next picture shows the HotPort 5020-E node. The LEDs are visible at the top of the node when it is oriented correctly for installation on a pole.

The next picture shows the connectors, reset cover screw, and ground screw on the bottom panel of a HotPort 5020-E node. Weatherproof caps protect the connectors on the bottom panel. Rubber caps are on the antenna connectors; they are not weatherproof.

> ⚠ **Caution!** Do not use the rubber caps outdoors. You must use weatherproof caps or weatherproof antenna connections to all antenna connectors. Damage from incorrect deployment is not covered by the product warranty.

For information about cables and accessories approved for use with Firetide devices, refer to the *Firetide Antenna Guide*.

Rubber cap   Ethernet Port   D/C power

Reset button (behind the   Ground screw   Mount bracket
pressure relief valve)
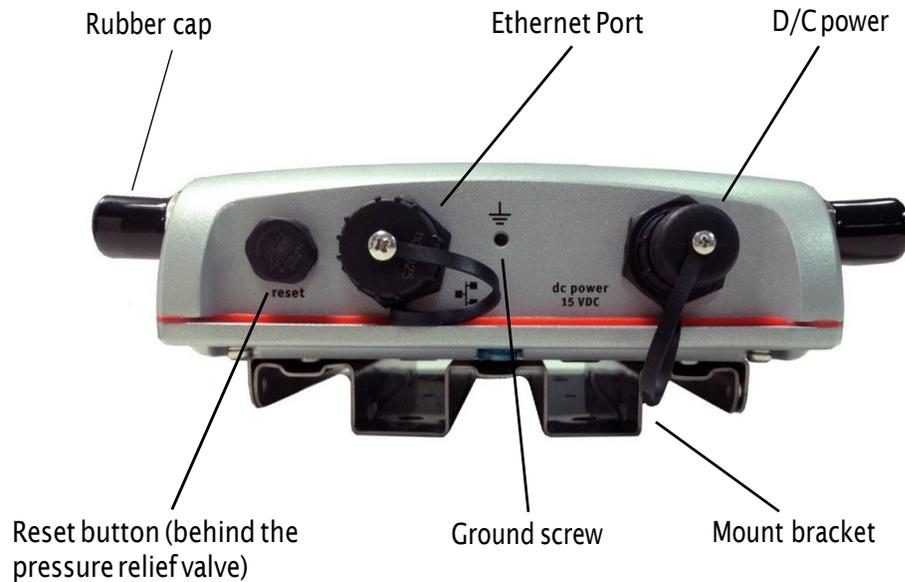
Ground screw

Firetide nodes must be connected to earth ground. The ground screw is on the bottom panel between the Ethernet port and the DC power connector.

LEDs

The panel that has the Firetide logo has these LEDs:

- Radio 1 and Radio 2, which indicate radio status. HotPort 5020-E nodes have one radio, which is always Radio 1. The Radio 1 LED comes on. The Radio 2 LED is always dark.
- Power, which is a green color when the device receives power. The LED is dark when the node does not receive power.

Reset button

The reset button is on the bottom panel and is covered by a weatherproof screw.

Antenna connectors

One side panel has three antenna connectors for one radio. For antenna connectors that you do not intend to use, you need to install 50 Ohm terminators (not included).

Test before you install

You should set up and test the nodes indoors on a table before you install them in permanent locations.

After you finish the tests, remove the staging antennas. Next, you attach the coaxial cable assembly that will connect to the outdoor antenna.

Caution! Do not use staging antennas outdoors because the HotPort can be damaged. The staging antennas are rated for indoor use only. Damage caused from outdoor use of indoor rated antennas is not covered by product warranty.

The benefits of tests before you install include:

- Make sure all of the equipment works before you install it
- Consistent settings across nodes to reduce software configuration errors in the field

Types of tests to do:

- Power on each device
- Attach all antennas and make sure you can see all devices in HotView Pro software
- Data and other application throughput tests to make sure the nodes can send and receive data
- Learn to use the radio alignment tool
- Train installation personnel

Materials that are not included

These items are required but are not included with a HotPort 5020 edge node:

- 50 Ohm terminators: If you do not intend to use an antenna connector, you must cover it with a 50 Ohm terminator. Terminators are not included in the box. Rubber caps are not sufficient for network use.
- Management license: HotView Pro detects each HotPort 5020 node and decrements the multiple unit management license count by one.

If the deployment uses DFS, then a DFS license is required.

Note: HotPort 5020 edge nodes come with a built-in MIMO license.

Required tools that are not included

You need a computer that has HotView Pro network management software 10.15.0.0 or later installed. HotView Pro and appropriate licenses are required. Before you set up the new network or add devices to an existing network, you must purchase and receive all licenses from your Firetide distributor.

Certification requirement

People who install and manage networks that contain Firetide products must complete the Firetide certification program.

Doing tests on a HotPort 5020 edge node

For efficiency, you can set up several nodes at one time.

Before you begin, if you want to add a new HotPort 5020 to an existing 7010/ 7020 mesh network, save a copy of the 7010/ 7020 mesh configuration and apply the file on the edge node.

To configure an edge node and do tests with HotView Pro software:

1. Put the node on a table.
2. Make the connections shown in the next figure.

Note. The administrator computer must have an IP address on the same subnet as the node. If the node is new, the default IP address is 192.168.224.150.
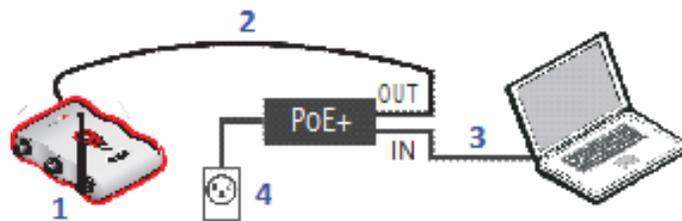
1 Staging antennas with adapters (HotPort 5020-E shown)

2 Ethernet cable from HotPort 5020-E to OUT port of PoE+ injector

3 Ethernet cable from laptop to IN port of PoE+ injector

4 AC power cord from PoE+ injector to power source

The power LED comes on. The node boots and is ready to use in one minute.

3. Single-click to start the Quick Launch feature of HotView Pro, which opens the server and client software at the same time.

4. Login with the correct user name and password. The default user name is hv_admin; and the default password is firetide.

   The system initializes.

5. Go to **Mesh > Add Mesh >** login with the default user name and password. The default user name is admin; and the default password is firetide.
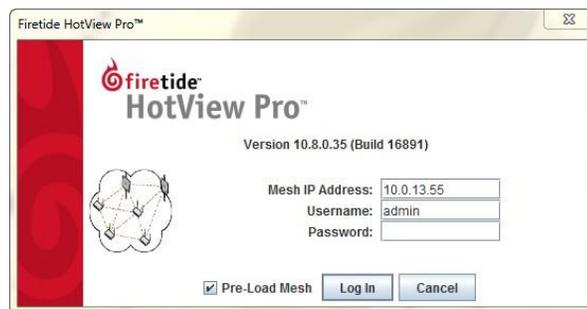
6. Make sure that the node is visible in HotView Pro.

   If you cannot see the node in the mesh network view, see the troubleshooting information in the *HotView Pro Reference Manual*.

7. Apply the saved configuration from a HotPort 7010/7020 mesh node.

Note: Set manual overrides, such as wireless mode and channel, if necessary.

8. Configure the node as needed:
   - Configure the radio or radios.
   - Set the extended range feature if the distance between the nodes is more than 0.8 km (0.5 mile). Set the range for the longest individual link in the mesh. *Example: 9 links are about 0.25 miles apart and 1 link is 3 miles apart. The range is 1 to 3 miles.*
   - Set the multi-hop optimization feature if needed.

Note: For information about specific features and configuration procedures, see the *HotView Pro Reference Manual*.

9. Repeat steps 2 to 13 for additional nodes.

If you will add this edge node to an existing network and are satisfied that it works correctly, you are ready to install it permanently.

If this is a new mesh or you have a HotPort 7010/7020 with which to test, do the next procedure.

Doing link performance tests

HotPort 5020 edge nodes do not connect to each other, but they can join with HotPort 7010/7020 mesh nodes in a test environment.

To measure link throughput performance:

1. Set up a HotPort 7020 to connect with the HotPort 5020 edge node.
2. Attach an Ethernet cable to the HotPort 7020 node.
3. Start HotView Pro.
4. Right-click on one of the two nodes between which you want to measure performance.
5. Select **Run Diagnostics Tools**, and select the second node from the menu.

   A window appears from which to select a test:

   - Ping. A ping test checks for a link between the nodes. It does not generate enough traffic to affect mesh operation. The ideal result is a low, consistent, ping response time. Highly inconsistent times indicate RF signal problems.
   - TCP Iperf and bi-directional TCP Iperf. Both tests send a large amount of TCP traffic between the nodes on one link. The bi-directional test runs the test traffic in both directions simultaneously.
   - UDP Iperf and bi-directional UDP. Both tests run a large amount of UDP traffic between the nodes on one link. The bi-directional test runs traffic in both directions simultaneously.
6. Select the type of test.
7. Click **Execute**.
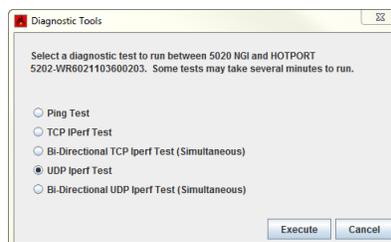
Note: Iperf tests flood a link with as much traffic as it can carry. This can disrupt other traffic on the mesh. Iperf sends a large, fixed amount of traffic. If iperf cannot complete the transfer in a fixed period of time, it stops. If you receive a failure message, run the test again. If the test fails consistently, substantial interference exists on the RF link.

> **Note:** If you are not able to get the mesh to send and receive data traffic indoors, see "Troubleshooting" on page 13.

8.   After you finish the tests, remove the staging antennas.

⚠️ **Caution!** Do not use staging antennas outdoors. The staging antennas are rated for indoor use only. Damage caused from outdoor use of indoor rated antennas is not covered by product warranty.

You are now ready to permanently install the node. Next, you have to attach the coaxial cable assembly that will connect to the outdoor antenna. See "Preparing a node for outdoor installation" on page 17.

Power Consumption table

Power input from DC supply: 24 W (Typical), 28 W (Max)

Power input from PoE: 24 (Typical), 26 W (Max)

Outdoor node installation

After you do tests and configure the nodes, then you are ready to install the nodes in a permanent outdoor location.

The work process is:

1. Collect all required tools.
2. Go to the site and make sure that:
   - No new safety hazards are present.
     - Link path calculations are correct.
3. Prepare safety equipment and confirm earth ground procedures.
4. Attach the nodes and antennas to poles that attach to a mast, tower, or roof.
5. Install the node and antennas assembly and other devices, such as cameras or access points to a permanent location.

Tools required

For HotPort 5020 edge nodes, you need to have:

- #2 Phillips screwdriver
- Small adjustable wrench
- Wire cutters to cut tie wraps around cables
- Electrical tape and butyl mastic or silicone tape to weatherproof the connectors

Other equipment you might need includes:

- Ladder
- Lift truck
- Safety equipment

Making sure the site is ready for installation

Before you install any equipment outside, check the entire site:

- To identify possible hazards that might be new since the original site survey
- To identify the presence of objects that might cause interference for the radios

Warning! Certified professionals must install Firetide products. If you do not install this equipment correctly, the equipment can be damaged, or you can be injured or killed.

Electrical shock hazard warning! Make a plan to keep the installation personnel safe.

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

Warning! Do not open the cover:

· Dangerous voltages inside.
· No serviceable parts inside.
· Refer to qualified service personnel.

Safe installation practices

Best practice: Install HotPort 5020 edge nodes on poles that are far enough away 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 a 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 condition.
· 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 correctly 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.

· 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 information.

Preparing a node for outdoor installation

It is easier to install all devices to one object, such as a pole, and then attach the pole assembly to the roof. If you attach the devices to a pole attached to the roof top, factors, such as weather, can make the installation more difficult and dangerous.

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

> **Warning!** Failure to obey these 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 nodes.

To prepare a node for outdoor installation:

1. Make sure that you have antennas rated for outdoor use. For information about antennas and how to select them, see the *Firetide Antenna and Accessory Guide*.

Note: Install the antenna and any other wireless devices higher than the HotPort node or access point.

2. Remove the mount bracket from the node.
   a. Use the Phillips screwdriver to loosen the four captive screws (two on each side).

Captive screws

   b. Remove the outer piece from the hooks on the node.

Mount bracket

Hooks on mount plate
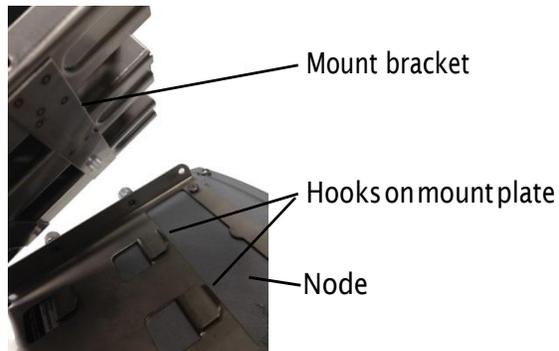
Node

    c.   Put the HotPort 5020 edge node in a safe place while you attach the bracket to a pole or wall.

3.   To a pole that you can install at a permanent outdoor site, attach these items:

-   Bracket for the node
-   Antenna bracket
-   (Optional) Other devices

4.   Attach the antenna to the antenna bracket. Refer to the installation procedures for the antenna.

5.   Attach the node to the bracket so that when it is in its permanent location the connectors point down, ports are on each side, and you can read the "Firetide" name.

The installation is correct if the device does not move side to side easily, the "Firetide" mark is oriented correctly, and the connectors are oriented to the ground.

Installing a node and antenna assembly

The process to install a node to a mast or tower is the same as a roof installation.

Note: Collect and take all tools and materials with you to the installation site.

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

To install a node and antenna assembly in a permanent outdoor location:

1. Safely lift and carefully put the assembly on the roof.
2. Attach the pole to which the node and antenna are attached to a mast, tower, or roof.
    -   Attach the cables that have integrated lightning arrestors, or attach the cables and install lightning arrestors. Cover all unused antenna connectors with 50 Ohm terminators.
    -   Make drip loops with cables.
    -   Make sure all grounding equipment is correctly installed.
3. Make all connectors weatherproof. See "Weatherproof procedures" on page 35.

Caution. Do not use port 2 or port 3 of a HotPort 7020 mesh node to power a HotPort 5020 node. A HotPort 5020 node needs PoE+ or 802.3at, and the ports of a HotPort 7020 mesh node are PoE 802.3af compliant only.

4. (Optional) Attach the Power over Ethernet (PoE) assembly to power the device.

Caution. Do not connect to more than one power source at one time.

    a. Attach an Ethernet cable from the Ethernet port of the node to the OUT port of the PoE+ injector.
    a. Attach the AC power cord to a power source.
5. (Optional) Use plastic tie wraps to keep cables organized.
6. Supply power to the node.

    If PoE is connected correctly, the LED becomes a steady green color.

    When you supply power to each node, they automatically make connections to each other. The nodes use the configuration that you created when you staged the nodes.
7. Make the PoE connection weatherproof.

⚠ **Caution!** The PoE injector is not for outdoor use. Do not expose the PoE injector to rain or direct sun.

8. Ping the IP address of the edge node to make sure the node works.

Opening the mount bracket

A HotPort edge node comes with an assembled two-piece mount bracket. The next picture shows a radio-side of a node and the assembled bracket. Two captive screws are on each side of the device.

Captive screws

The next picture shows the bracket pieces and orientation to the node. The mount bracket has multiple holes and slots, so you can use bolts, straps, or other materials to attach the node to a surface.

Image A shows the side of the mount bracket on which the chassis is attached. Image B shows the bracket on which you hang the node. This bracket attaches to a pole or other surface.
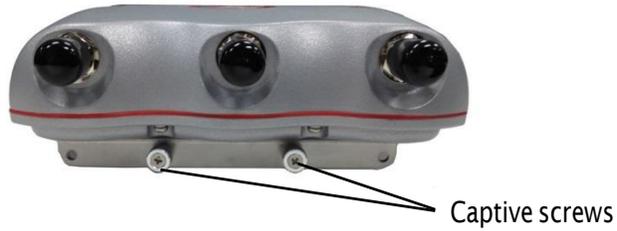

A

B

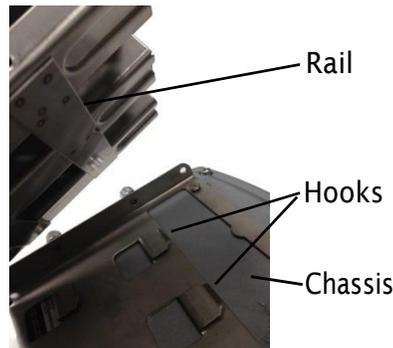The mount kit includes extra nuts and bolts.

Required tools: #2 Phillips screwdriver

To open the mount bracket for wall or pole installation:

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

Captive screws

2.   Remove the outer piece from the hooks on the node.

Rail

Hooks

Chassis

3.   Put the HotPort 5020 in a safe place while you attach the bracket to a pole or wall.

4.   Attach the mount bracket to a pole or wall.

The next procedures list the steps to attach the bracket and node to different surfaces.

Attaching the node to a wall

Required materials:

- Mount bracket
- Four screws (included in the mount kit) or masonry anchors (not included in the mount kit)
- node with one bracket piece with hooks

To attach a node to a wall:

1.   Use four screws or masonry anchors to attach the mount bracket securely to the wall. Put the screws or anchors in the two holes near the top and the two holes at the bottom of the bracket.

2.   Hang the node hooks on the rail.

The installation is correct if the node does not easily move from side to side, and the connectors are oriented to the ground.

Note: You can add other straps or a sling to increase durability of the attachment to the wall.

Best practice: Use a spray to prevent corrosion on the bracket and mount hardware.

Attaching a node to a vertical pole

Required materials:

- Mount bracket
- Mount kit
- Node with one bracket piece with hooks

Recommended tool: hex wrench (included in mount kit) or small adjustable wrench

To attach the node to a vertical pole:

1. Put the two U-bolts through the holes in the gripper.
2. On each U-bolt, put a washer, a lock washer, and a nut.

Note: A pole with a small diameter usually requires a second nut to hold the bracket away from the U-bolt.

Hex wrench   U-bolt

Nuts for standoff   Gripper
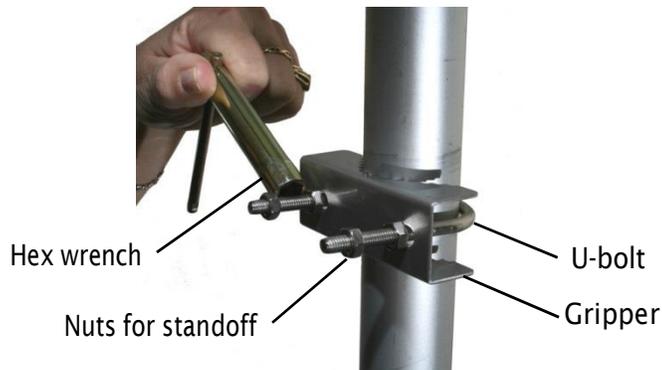
3. Tighten the nuts by hand.

   The U-bolt should extend 12 to 15 mm (0.5 to 0.6 inch) beyond the second nut.

4. Put on the second U-bolt and gripper. Use the bracket as a guide to correctly space the two U-bolts.

5. Tighten the nuts with the hex wrench.

6. Use lock washers and nuts to secure the bracket to the U-bolts.

Rails

U-bolts
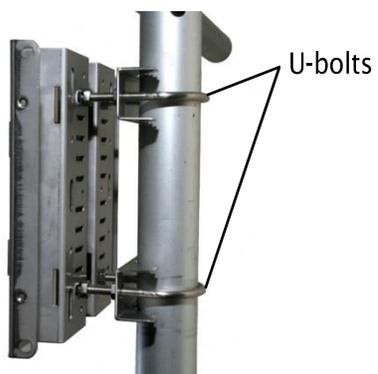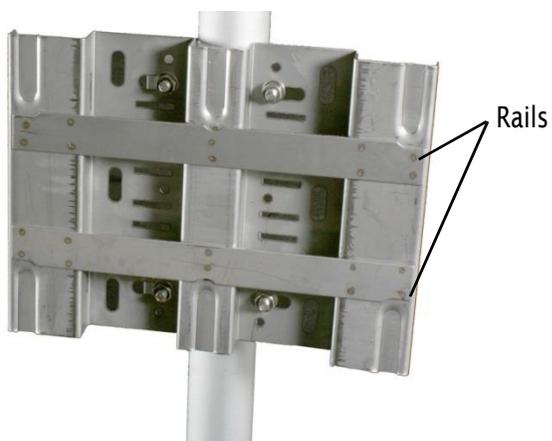
7. Hang the node with the hooks over the rail of the bracket.

The installation is correct if the node does not easily move from side to side, and the connectors are oriented to the ground.

Note: If you need to, add other straps or a sling to increase durability of the attachment to the pole.

Best practice: Use a spray to prevent corrosion on the bracket and mount hardware.

Attaching a node to a horizontal pole

Recommended tool: hex wrench (included) or small adjustable wrench

To attach the node to a horizontal pole:

1. Attach the two grippers and U-bolts to the pole. Use the bracket to determine the correct space between the grippers.

2. Use lock washers and nuts to secure the bracket to the U-bolts.
3. Hang the node with the hooks over the rail of the bracket.

4. With the Phillips screwdriver tighten the four captive screws to secure the node to the bracket.

The installation is correct if the node does not easily move from side to side, and the connectors are oriented to the ground.

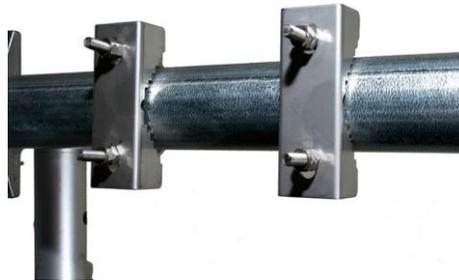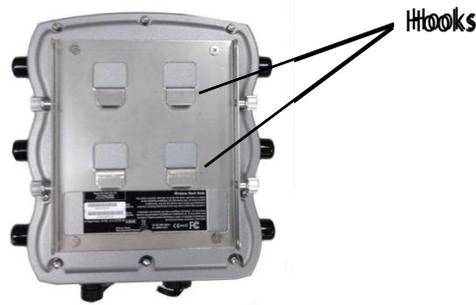**Note:** If you need to, add other straps or a sling to increase durability of the attachment to the pole.

Best practice: Use a spray to prevent corrosion on the bracket and mount hardware.

Attaching straps

You need to use straps when you use poles of 5 cm (2 inches) or more in diameter. You can also use straps for extra support and durability in corrosive environments.

Straps are not included in the box.

To attach the node to a pole with straps:

1. Position the universal mounting bracket against the pole.
2. Wrap two straps around the pole and thread them through the channels between the main piece of metal and the rails.

3. Secure the straps.
4. Hang the node with the hooks over the rail of the bracket.

5. With the Phillips screwdriver tighten the four captive screws to secure the enclosure to the bracket.

   The installation is correct if the node does not easily move from side to side, and the connectors are oriented to the ground.

Note: If you need to, add other straps or a sling to increase durability of the attachment to the pole.

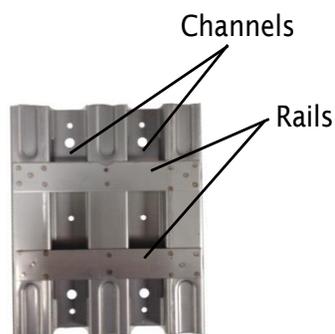**Best practice:** Use a spray to prevent corrosion on the bracket and mount hardware.

Weatherizing the connectors

The HotPort 5020-M node comes with a field-installable weatherized Ethernet connector.

Correct weatherproofing includes:

- Sealing all antenna connectors and antenna connector terminators
- Installing the weatherized Ethernet connector
- Using a spray to prevent corrosion on the bracket and mount hardware

For weatherizing procedures, see "Weatherproof procedures" on page 35.

Hooks

Troubleshooting

If a HotPort 5020 edge node does not operate correctly, try these suggestions.

If you recorded the performance of your network when you set it up, you have a benchmark against which you can compare future performance. With benchmark information, you might be able to identify problem areas faster than if you try to diagnose a new problem.

DFS

A DFS license is not required to use DFS channels in the USA; however, access credentials are required.

If you need to use DFS channels on this node, you need to do these things:

1. Take and pass the DFS certification training course.
2. Request DFS login credentials.
3. Use these credentials to set a password, and create an offline file w/ login credentials (this is only necessary if the mesh does not have internet access).

This product also requires a management license so that you can manage the device from the HotView Pro network management software.

For more information about DFS management, refer to the *HotView Pro Reference Manual*.

Cannot see a node in HotView Pro

When edge nodes are a part of a mobility solution, you cannot see the edge nodes in the HotView Pro FMC mobility view. You can see and manage edge nodes in the mesh network view of HotView Pro.

If you cannot see one or more nodes in HotView Pro, make sure that you set the extended range and enable multi-hop optimization, as necessary:

- The extended range feature is for applications where nodes are 0.8 km (0.5 mile) or more apart. The extended range feature is a mesh-wide setting. This range should be the length of the longest individual link in the mesh.
- The multi-hop optimization feature decreases the possibility of packet collisions.

If you can see the head node only, not other nodes in your mesh, then you also might have a configuration problem.

Check the power and cables.

Caution! You cannot use a HotPort 7020 power cable (15V) to give power to a HotPort 5020 edge node, which requires 12V. The higher current from the 15V cable can damage the components of the HotPort 5020 edge node.

After multiple reboots a node is missing

If a node reboots five times within 10 minutes, the node loads the second saved firmware image.

·   The previous firmware, if older or different from the firmware of the other nodes in a mesh network, might not be recognized by the mesh and HotView Pro will not detect the node.

    To prevent this behavior, always upgrade the firmware image on each node two times, so both images are the same.

·   When you upgrade an image, the system overwrites the current configuration. Any configuration changes you make to the new image are not copied to the backup image. Sometimes, when you revert to the backup image, a node might not immediately recover.

·   Check for self-interference. Radios 1 and 2 in a node cannot connect to each other because HotView Pro does not let you configure Radios 1 and 2 within a node to use the same channel.

    Self-interference on the same node is caused by antennas that are too close. In the case of directional antennas, we recommend at least 1 meter (3 feet) of physical separation.

    Self-interference within a mesh happens when nodes operate on the same channel. You can reduce mesh interference with:
    -   Multi-hop optimization
    -   Strategic alignment of antennas
    -   More channel diversity in the mesh

Static routes

The use of static routes with an edge node is not recommended.

If you enable a static route on an edge node, and the neighbor radio to which the edge node connects becomes unusable, the node cannot recover the link with another neighbor.

Performance not as expected

If the network performance is not as expected:

- Identify reuse in your channel plan. If you have no channel reuse in the network, do a spectrum analysis.
- Check for self-interference. For example, the radios in a single device might connect.
- Check the frequency plan and make sure that all the radios are configured correctly.
- Make sure that each node is connected to the correct devices and nodes.
- Determine the total throughput with an end to end test.
- Determine the throughput of each link with tests.

Resetting an outdoor node to factory default settings

Do a reset when you remove a device from the field or when communication with a device is lost.

⚠️ **Caution!** When a HotPort 5020 edge node is reset, configuration information is erased.

You can reset a HotPort 5020 edge node with the reset button. The reset button is behind the pressure relief valve on the bottom panel of the node.

For this procedure you need:

- Paper clip, stiff wire, or thin piece of plastic or wood, such as a skewer
- Computer with HotView Pro
- Ethernet cable
- Wrench or your fingers to turn the pressure valve

To reset a HotPort 5020 edge node:

1. Supply power to the node.

   Wait until the status LED comes on. After one minute, the node is ready to be reset.

2. With a wrench or your fingers turn the pressure valve counter clockwise to remove it.

3. Put it in a safe place until you finish this procedure.

4. Put the node on its front panel.

5. Press and hold for 20 seconds the reset button with the paper clip or other tool.

   When the Radio 1 LED blinks to indicate that the software is rebooting, you can stop pressing the reset button.

6. Wait one minute, and then log in with HotView Pro.

7. Configure the node or apply a previously saved configuration file.

8. Replace the pressure valve that covers the reset button.

Scheduling firmware upgrades and activation

By default, the system uses the configuration in cache for multiple upgrades.

Best practice: Upgrade the image two times because you want the backup image and primary images to be the same. If a backup image is older than the primary image, the node might not support the same features.

You can:

· Upgrade and activate the firmware now.
· Upgrade the firmware now and activate it later.
· Upgrade the firmware on a specified day at a configured time and then activate it immediately or later.

By default, the scheduler activates the firmware immediately.
If you select the **Activate Later** check box, the scheduler copies the firmware image to the node but does not activate the firmware.
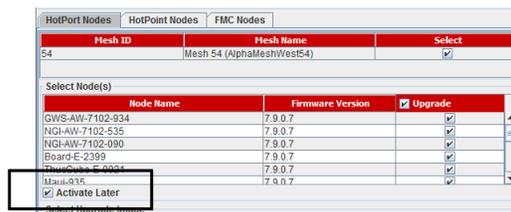

When you schedule an upgrade time (Scheduler Operation: Later), the HotView server, if it is running, starts the job at the scheduled time. If the HotView server is not running at the time scheduled, the scheduled jobs start immediately after you start the HotView server.

Best practice: If you choose to upgrade a production mesh, schedule the upgrade and activation for a convenient time. Firmware upgrades can consume considerable bandwidth. The mesh is not available for two minutes when you activate new firmware.

To schedule a firmware upgrade for a later date and for later activation:

1. Go to **Network > Upgrade Firmware**

   The upgrade scheduler appears.
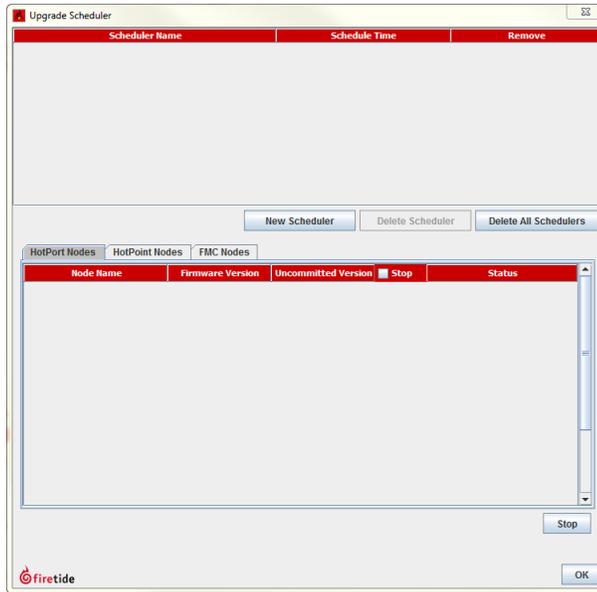
2. Click **New Scheduler**.

    a.   Select Upgrade.

    b.   Select the time: Later. Use the calendar to a future date and time.

    c.   Click the tab to select a device type (HotPort Nodes for a mesh network, HotPoint Nodes for access points, or FMC for mobility controllers), and then select the mesh or device by ID or name.

Note: The system selects all nodes within a mesh for simultaneous upgrade because all of the nodes have to run the same firmware. If a node should not receive the upgrade image, you can remove the mark from the upgrade check box.

    d.   Select **Activate Later**.
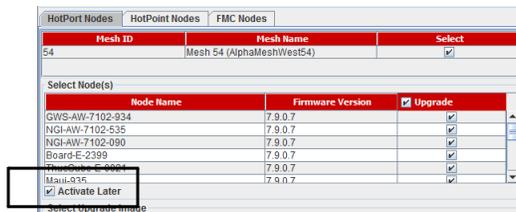
    e.   Select the upgrade image.

3. Click **OK**.

The "upgrade complete" message means that the image file is on the node and is valid. You can then activate a few nodes at a time until all of the nodes are running the same firmware version.

Setting the country code on a new edge node

To set the country code on a new edge node:

1. Put the node on a table.

2. Attach the Ethernet cable from the administrator computer to the node.

Note. The administrator computer must have an IP address on the same subnet as the node. If the node is new, the default IP address is 192.168.224.150.

3. Provide power to the 5020-E via the included PoE or a DC power source that you have designed per datasheet specifications.

4. The power LED comes on. The node boots and is ready to use in one minute.

5. Attach the staging antennas.

6. Single-click to start the Quick Launch feature of HotView Pro, which opens the server and client software at the same time.

7. Login with the correct user name and password. The default user name is hv_admin; and the default password is firetide.

   The system initializes.

8. Go to **Mesh > Add Mesh >** login with the default user name and password.
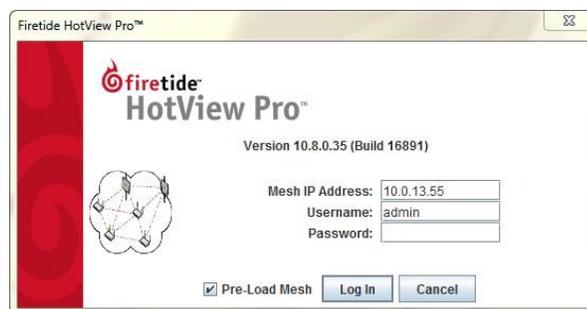

When you add the mesh, the system prompts you for the country code.

9. Set the country code for the node to change the device from a low-power, low range setting to a correct full-power operational mode.

> ⚠️ **Caution:** Make sure you configure the device for the correct country. If you do not configure the country correctly, the device might operate in a manner that is not legal or create problems with other wireless devices.
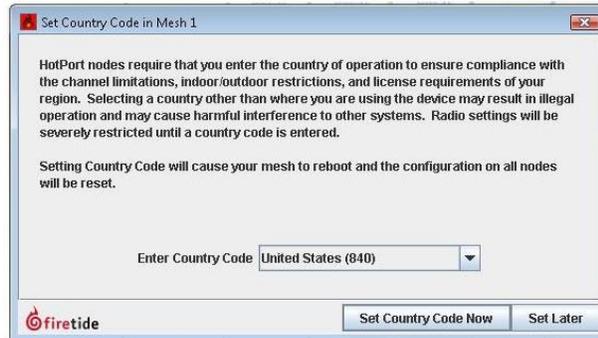
a. Select the country of operation from the drop-down list.

b. Click **Set Country Code Now**.

When you set the country code the system refreshes the mesh configuration and gives all visible nodes the same country code. For a few minutes the nodes might appear and disappear from the graphic mesh record in HotView Pro.

c. Wait for three minutes for the system to finish the refresh.

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 correctly weatherproofed connectors on a HotPort 7020 mesh node with a sun shield.

Antenna with weatherproof connector

Weatherproof connectors

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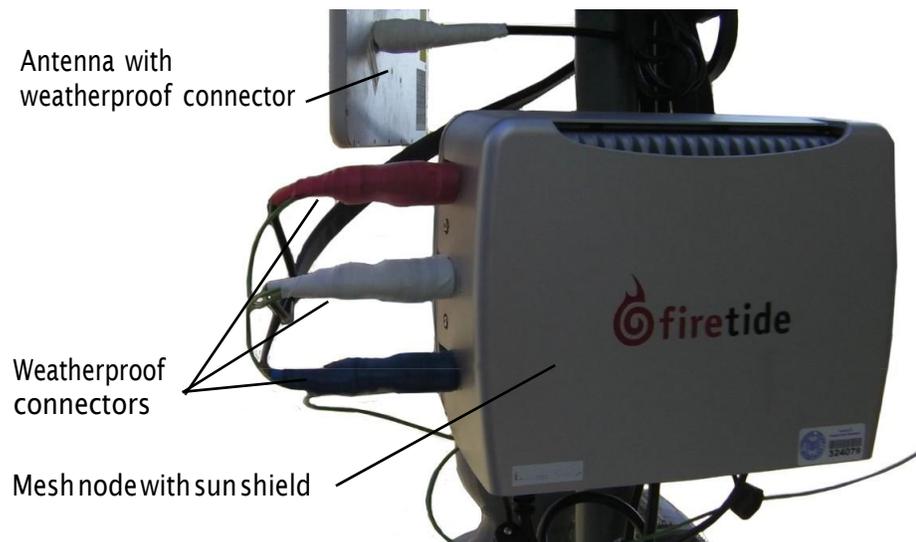
Best practice: You can use colored tape for easy identification of the connectors from the mesh node to the antenna.

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

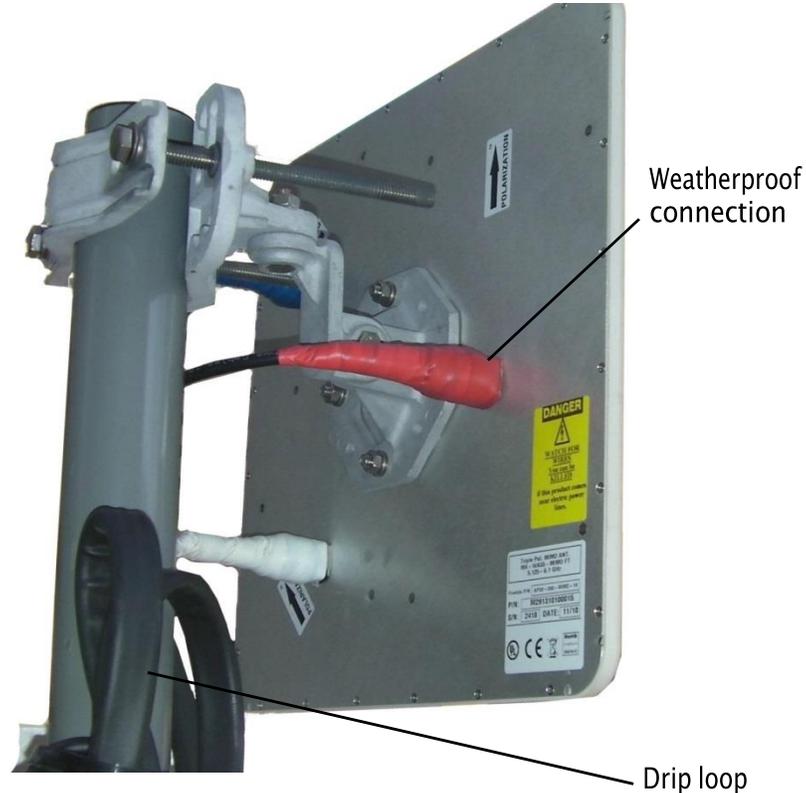To make a weatherproof connection you need the following tools and materials:

· 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.

Weatherproof connection

Drip loop

To make a weatherproof antenna connection:

1. Gather the tools and materials to do the procedure.

Mastic tape

2. Ensure that the cable and connector is clean. Clean off oil, water, grease, and dirt before you continue.
3. Attach the cable connector to the antenna connector, and then use pliers to tighten the connection.
4. With a laptop 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. 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.

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

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

The antenna connector is ready for installation in an outdoor environment.

Making a weatherproof cable to node connection

You need to make weatherproof two connections:

- 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.

Mastic tape

2. Remove the sun shield because you must put tape around all of the connector.
3. Ensure that the cable and connectors are clean. Clean off oil, water, grease, and dirt before you continue.

4. 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.

5. 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.

6. 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.

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

8. 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.