Access Point and Network Controller Mounting and Installation Guide
**Overview**

In support of Installation of a new Viasat Community Internet – WiFi Hotspot site, this section provides step-by-step instructions on how to physically mount, cable, and install the MikroTIK Access Point (AP) and Network Controller (NC).

**This mounting process should occur AFTER modem and wi-fi device activation is complete. The galvanized steel pole should already be mounted before beginning this process.**

**REQUIRED ITEMS:**

- One Mikrotik Access Point (AP)
- One Mikrotik Network Controller (NC)
- One power cord (included with the NC)
- One slide-on attachment (included with the NC)
- One PoE injector (included with the NC)
- One flathead screwdriver
- One Viasat Modem
- One UPS
- Plenty UV-rated zip ties to tie down cabling
- One mounted galvanized steel pole
- Pole mount and hardware
- One terminated UV-rated ethernet cable for NC to Modem
- One short terminated UV-rated ethernet cable (for NC to AP)
- Three 76mm steel clamps
- One set of needle-nose pliers
- One set of wire cutters/metal clippers
- One galvanized steel ground strap
- Grounding wire 12awg or lower.
NOTE: A different model may be used for the MikroTIK items in pictures below, but the process is identical.

NOTE: Before beginning the installation process, verify that the chosen mounting location can be visually seen from most locations within the community (especially places that are heavily foot-trafficed such as plazas, sports fields, schools, etc) and avoids obstructions such as buildings, trees, shrubs or any large structure that prevents clear line of site.

Below are examples of barriers that create interference:

<table>
<thead>
<tr>
<th>Type of Barrier</th>
<th>Interference</th>
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</thead>
<tbody>
<tr>
<td>Wood, Glass or Synthetic Material</td>
<td>Low</td>
</tr>
<tr>
<td>Water, Trees and Bushes, Bricks, and Marble</td>
<td>Medium</td>
</tr>
<tr>
<td>Plaster &amp; Concrete</td>
<td>High</td>
</tr>
<tr>
<td>Metal</td>
<td>Very High</td>
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</tbody>
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The optimal height for mounting the Access Point is 6-8 meters from the ground with a max height of 9 meters. The AP must be installed **FULLY ABOVE THE NC** on the pole and a minimum of 1.5 meters (preferably 3 meters) above the peak roof line.

The AP must not be installed against a wall or below the roof line or else the building materials will cause interference and cause slower speeds.

AP’s must be installed vertically – if there is too much tilt on the AP then the install will be rejected upon review by Support.

AP’s must be installed at least 1 meter away from any other antenna on the building.

If there is a better mounting location, discuss this with the business owner before moving forward and include the reason for change in the Post-Installation document.
Installation Instructions:

STEP 1 | Mount the AP to the Pole

A. If it was not already attached during activation, attach the small antenna to the top of the AP by gently twisting the textured nut at the bottom of the antenna (circled in red) so it resembles the below picture. **DO NOT TWIST THE ANTENNA ON OR IT MAY BREAK.**

B. Mount the AP to the **galvanized steel pole** (represented in the following pictures as a PVC pole) by tightening one 76mm steel clamp around the AP’s mounting divert with a flathead screwdriver or nut driver.
C. Repeat this step with a second 76mm clamp around the bottom divot of the AP.

D. Clip excess clamp metal with metal cutters – leaving enough excess slack to remove and re-attach the AP if required in the future

STEP 2 | AP Ethernet Cord Install

A. Remove the bottom cap of the AP by twisting.
B. Remove the rubber stopper on the bottom of the cap.

C. Insert an ethernet cable through both the rubber gromet and the cap.

D. Reattach the rubber gromet to the cap.
E. Connect the ethernet cord to the AP.

F. Reattach the cap to the AP. Ensure there is no protrusion from the gromet (circled in red) when twisting the cap back on.
STEP 3 | Mount the NC to the Pole

A. Mount the slide-on attachment for the NC to the pole on the opposite side of the AP using the third 76mm clamp and a flathead screwdriver. Make sure the tab of the slide-on attachment is face-up as shown below.

Note: Be careful not to break the slide-on attachment plastic by accidentally over-tightening the metal clamp.

B. Clip any excess clamp metal with metal cutters – leaving enough excess slack to remove and re-attach the AP if required in the future.

C. Slide the NC onto the slide-on attachment until it clicks (model may vary).
STEP 4 | NC Cable Installation

A. Remove the bottom cover of the NC as shown below.

B. Use pliers to remove the outermost plastic tabs on either end of the cover (circled below) so that it matches the picture on the right.
C. Repeat this process for the corresponding plastic tabs on the main NC unit then connect the AP ethernet cable to Port 5 of the NC.

D. Connect a loose ethernet cable to Port 1 as shown below. The cable in Port 1 will connect to the PoE injector and then to the modem and UPS.

![Port 1 and Port 5](image)

E. Hold the cables down in the removed openings and reattach the bottom cover.

F. Secure both cables onto the mounting pole with UV-rated zip ties where needed.

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**STEP 5 | Powering-On Devices (Inside Equipment)**

A. Route ethernet cabling from the mounting pole to the inside network equipment area.

**CABLE ROUTING NOTES:**

For horizontal cable runs, attach the cables to the wall surface using screw clips every 18 to 24 inches.

For vertical cable runs, attach cables to the all surface with screw clips every 30 to 36 inches.

Keep the cable run as straight as possible but remember to use the correct bend radii of **1 inch**. Follow horizontal and vertical elements (such as the siding) at every opportunity. Diagonal or aerial cable runs are not allowed.

Remember! **Never put a 90-degree bend in any cable run.**

These cables can be routed into the building in the same way as the RG6 cabling installed for the satellite ODU.
B. Connect the NC Port 1 ethernet cord to the PoE injector.

C. Connect the PoE injector to the NC power cord and the NC power cord to the UPS.

NOTE: The Modem and Network Controller power cords must be plugged into one of the 4 “Battery Backup + Surge Protection Outlets” on the UPS. The image below shows where these outlets are located on the device.
D. Connect the PoE injector from Port 1 of the NC to Port 1 of the Viasat Modem (circled in red below) located inside the building.

E. On the NC, verify green lights turn on for Power, Port 1, and Port 5 as shown below. These indicate successful connections.
F. On the AP, verify the bottom green light turns on as shown below. This indicates successful power connection.

**TROUBLESHOOTING NOTE:** If the devices have issues connecting you may need to PowerCycle the UPS located in the inside equipment.

To do this, press and hold the POWER button on the UPS for at least 2 seconds. At the first beep, release the button and the UPS will turn off.

To turn it back on, press the POWER button (no need to hold). A light will illuminate green and a single short beep will indicate the UPS is powered back on.
STEP 6 | Grounding the Mounting Pole

A. To ground the galvanized steel mounting pole for the Wi-Fi devices, first install the UL-listed grounding strap to the bottom of the pole.

![Image of grounding strap on pole]

B. Attach 12 awg (or thicker) grounding wire to the grounding strap and run grounding wire from the pole to the grounding source.

**NOTE:** A grounding bus is required if the distance from the pole to the grounding source is over 6.5 meters. If a grounding bus is used you can run an additional 6.5 meters of grounding wire 10 awg (or thicker) from the grounding bus to the grounding source.

C. The Wi-Fi hardware install is complete! Next step is to verify a successful Wi-Fi connection.

![Image of Wi-Fi devices on pole]
STEP 7 | Verifying the Network Connections

A. Using your 5GHz laptop (or 5GHz smartphone if one is available – see equipment list for phone requirements) verify that the SSIDs appear for both 2.4 GHz and 5 GHz by doing the following:

i. Verify the IP address for the 2 Networks (Viasat POS and Viasat WiFi) found in the network info of each matches the MAC Address of the NC while standing close (10 meters) to the devices. Verify that both the Captive Portal and POS Portal load properly.

ii. Move away from the devices until the IP addresses of both networks change. Verify this new IP address matches the MAC address of the AP. Verify, again, that both the Captive Portal and POS Portal load properly.