User guide for NANOSTATION 5

1. Introduction.

Nano Station 5 operates in IEEE 802.11a mode, while the Nano Station 2 operate in IEEE 802.11b/g modes. Before using your device, check the wireless mode you want to set-up in order to use the proper device.

2. Connecting hardware.

Connecting your device to your network is very easy, as it’s using the POE (Power Over Ethernet) technology. For this you will need two direct Ethernet cable (RJ45) and the power adaptator provided.

First of all connect one cable to the POE entry and connect the other end to the device. The other cable is connected between the LAN entry and your Ethernet computer access.

Now just connect the power adaptator to the DC plug.

3. Applications.

This device can be set up and used for different applications:

- Simple AP (Access Point)
- Wireless Repeater
- Bridge
4. Configuring your computer in able to set up your device.

This chapter will explain you how to set up your network connection to get access to the device.

- In your computer, open Control Panel > Network Connections > Local AreaConnection.
- In Local Area Connection Status > General, click Properties.
- In Local Area Connection Properties > General, select Internet Protocol (TCP/IP) and click Properties.
- In Internet Protocol (TCP/IP) Properties > General, select Use the following IP address.
- Enter your IP address and Subnet Mask. The default IP address of the radio is 192.168.1.21, which cannot be used here. So type IP address 192.168.1.21 and gateway 192.168.1.20
- Click OK and Close
Open your browser (e.g. Internet Explorer, Firefox, Opera, etc.) and type in address bar: **http://192.168.1.20** (The default address of the device) then press the Enter key.

When the connect page appears type the default username “ubnt” and password “ubnt” below:
5. Configuration

- **Simple AP (Access Point)**

We consider this simply network topology:

One Router/Gateway connected to Internet and/or private LAN (IP Address: 10.10.10.254/24)

One AP AirOS device directly connected to Router (IP Address: 10.10.10.253/24)

One or more Wireless Clients (Notebook, WiFi-Phone, other Wireless devices...)

The Router assigns IP Address to network devices by DHCP Server. Alternatively, if you prefer, you can set static IP Address on Client.
**In LINK SETUP Tab, set:**

**Wireless Mode: Access Point**

- **SSID:** yourSSID (or any other string to identify your WLAN)
- **Country Code:** set according your country
- **IEEE 802.11 Mode:** A IEEE 802.11 mode (assuming devices running in 5 GHz)
- **Channel:** 1 - 5224 MHz (or any other free channel)
- **Output Power:** 10 dBm (or check Obey Regulatory Power according your country law)
- **Data Rate, Mbps:** 54, Auto
- **Security:** WPA (or any other, supported by Wireless Client)

![Basic Wireless Settings](image)

![Wireless Security](image)
The device is now ready as an AP, the next step concerns setting up the network after your router/gateway. The AP has to communicate with your router in order to spread your wireless connection.

In **NETWORK TAB**, set:

- Network Mode: Bridge
- IP Address: **10.10.10.253**  
**New IP address for the AP**
- Netmask: **255.255.255.0**
- Gateway IP: **10.10.10.254**  
**IP address of your router/gateway**
- Primary DNS IP: **10.10.10.254** (or DNS IP provided from your ISP)
- Secondary DNS IP: as Primary DNS IP

Click "Change" wait until process is complete and click "Apply" to confirm new configuration.

Now the devices should be reachable on new IP Address **10.10.10.254**. Remember to assign to your PC an IP of Subnet 10.10.10.x (e.g. **10.10.10.200/255.255.255.0**)

**Client Setup**

In TCP/IP Network Section:
If supported, set device to obtain Address IP automatically

Otherwise set statically:
IP Address: any free IP 10.10.10.x/255.255.255.0
Gateway: 10.10.10.254
DNS: 10.10.10.254 (or DNS provided by your ISP).
• **Wireless Repeater**

![Diagram of Wireless Repeater](image)

As you have previously set up your device as an AP, you are now able to set up another device as a repeater. This allows you to extend your coverage up to 20 kms.

First AP: 10kms and 10kms more with the second AP.

We will explain below how to setup your both devices.
Before starting the configuration of both AP, you will need to collect the WLAN MAC address of the PS, it is actually the physical address of the devices. You need to login into AirOS WEB User Interface of AP and write down this information:

We will select these two address as an example (you need to get your personal address)

AP#1  WLAN MAC 11:11:11:11:11:11

Be sure to have WLAN MAC of both devices before starting configuration

![Image of AirOS WEB User Interface]

WLAN MAC of both AP in this Tab
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- **AP #1 Setup**

Login into AirOS WEB User Interface of AP #1 and set as below:

**NETWORK Tab**

- Network Mode: **Bridge**
- IP Address: **10.10.10.253**
- Netmask: **255.255.255.0**
- Gateway IP: **10.10.10.254**
- Bridge IP Address: **Static**

Click *Change* button to confirm
Click *Apply* button to apply changes
Wait until process is complete

**LINK SETUP Tab**

- Wireless Mode: **Access Point WDS**
  - *WLAN MAC of AP #2, you can see on MAIN Tab of AP #2*
- SSID: **my wlan** (or any string to identify your WLAN, but the same for all WDS Peers)
- Country Code: set according your location
- IEEE 802.11 Mode: **A**
- Channel Spectrum Width **20MHz**
- Channel: **1 - 5224 MHz** (or any other free channel, but the same for all WDS Peers)
- Output Power: **10 dBm** (or check *Obey Regulatory Power* according your country law)
- Data Rate, Mbps: **54, Auto**
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Click Change button to confirm
Click Apply button to apply changes
Wait until process is complete

AP #2 Setup

NETWORK Tab

- Network Mode: **Bridge**
- IP Address: **10.10.10.253**
- Netmask: **255.255.255.0**
- Gateway IP: **10.10.10.254**
- Bridge IP Address: **Static**

New IP address for the AP
IP address of your router/gateway

Click Change button to confirm
Click Apply button to apply changes
Wait until process is complete
LINK SETUP Tab

- Wireless Mode: Access Point WDS
- Auto: enable check box
  \[WLAN MAC of AP \#1, you can see on MAIN Tab of AP \#1\]

- SSID: my wlan (or any string to identify your WLAN, but the same for all WDS Peers)
- Country Code: set according your location
- IEEE 802.11 Mode: A IEEE 802.11 mode (assuming devices running in 5 GHz)
- Channel Spectrum Width 20MHz
- Channel: 1 - 5224 MHz (or any other free channel, but the same for all WDS Peers)
- Output Power: 10 dBm (or check Obey Regulatory Power according your country law)
- Data Rate, Mbps: 54, Auto

Click Change button to confirm
Click Apply button to apply changes
Wait until process is complete
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- Bridge

This mode allows you to:

- Share a neighbors internet connection from across the street (must have there permission and must be legal from there provider).
- Bridge your internet/local area network with another building.
- Make a standard layer 2 transparent bridge for joining two LAN networks.

For this mode, you need two devices, in order to setup a point to point connection (PxP).

**AP #1 Setup (the side with the internet connection)**

Login into AirOS WEB User Interface of AP #1 and set as below

**LINK SETUP Tab**

Wireless Mode: Access Point WDS

- SSID: MY WLAN (or any other string to identify your WLAN)
- Country Code: set according your country
- IEEE 802.11 Mode: A IEEE 802.11 mode (assuming devices running in 5 GHz)
- Channel: 6 - 5237 MHz (or any other free channel)
- Output Power: 10 dBm (or check Obey Regulatory Power according your country law)
- Data Rate, Mbps: 54, Auto
- Security: WPA (or any other, supported by Wireless Client)
Once you have changed all settings, hit the Change button at the bottom of the screen. DO NOT HIT the apply button that appears at the top of the screen just yet.

**NETWORK Tab**

- **Network Mode:** Bridge
- **Bridge IP Address:** Set this to DHCP
- **Auto Fallback IP:** Leave this setting to default. If for some reason the unit does not get an IP address you will use this fallback IP to access the unit.

Click *Change* button to confirm

Click *Apply* button to apply changes

Wait until process is complete

Now that the unit has rebooted, unplug the Ethernet from your computer and plug the device into an open LAN port of your router. Once this is done the unit is setup and ready to accept the station side of the bridge.
AP #1 Setup (the side to bring the internet connection)

Login into AirOS WEB User Interface of AP #2 and set as below

**LINK SETUP** Tab

Wireless Mode: **Station**

- SSID: **MY WLAN** (or any other string to identify your WLAN)
- Country Code: set according your country
- IEEE 802.11 Mode: A IEEE 802.11 mode (assuming devices running in 5 GHz)
- Output Power: **10 dBm** (or check *Obey Regulatory Power* according your country law)
- Data Rate, Mbps: **54, Auto**
- Security: **WPA or WEP** (or any other, supported by Wireless Client)

**NETWORK** Tab

- Network Mode: **Bridge**
- **Bridge IP Address**: Set this to DHCP
- **Auto Fallback IP**: Leave this setting to default. If for some reason the unit does not get an IP address you will use this fallback IP to access the unit.

Click *Change* button to confirm
Click *Apply* button to apply changes
Wait until process is complete

Now that the unit has rebooted, unplug the Ethernet from your computer and plug the device into an open WAN port of your router, or directly into the computer you want to have access to the internet.

This completes the bridging setup of the UBNT device. If you cannot get it to work following the provided instructions please visit:
Use antenna alignment tool to adjust the device antenna to get better link with the wireless device. The antenna of wireless client has to be adjusted to get maximum signal strength.

Click the **Align Antenna…** button and the new pop-up window with signal strength indicator will appear. The **RSSI Range** slider can be used to change an offset of the maximum indicator value.

Window reloads every second displaying current value of the signal strength: **TX Rate**

![Antenna alignment tool](image)

**Figure 3 – Antenna alignment Tool**

- **RX Rate:** displays the current data reception rate while operating in **Station** mode.
- **Channel:** displays the channel used by device to transmit and receive data.
- **Frequency:** displays the frequency used by device to transmit and receive data.
- **Antenna Polarity:** displays the current Antenna Polarity setting.
- **Security:** displays the security method, which is set on the device.
- **ACK Timeout:** displays current ACK Timeout value, which is set on the device manually or adjusted automatically.
- **QoS Status:** displays the QoS Status, which is set on the device.
- **Uptime:** indicates the time, expressed in days, hours, minutes and seconds since last hard-reboot.
- **LAN Cable:** displays the current status of the Ethernet port connection.
- **LAN MAC:** displays the MAC address of the LAN (Ethernet) interface.
- **WLAN MAC:** displays the MAC address of the WLAN (Wireless) interface.
- **LAN IP address:** displays the current IP address of the LAN (Ethernet) interface while operating in **Router** mode.
- **WLAN IP address:** displays the current IP address of the WLAN (Wireless) interface while operating in **Router** mode.
- **LAN IP address** and **WLAN IP address** displays the same value - current IP address of the virtual bridge interface, while operating in **Bridge** mode.
Show Stations... selection lists the stations which are connected to the device while operating in Access Point mode. Each station RSSI, Tx Rate and Idle time (sec) can be updated using the Reload button:

![Table of Stations]

*Figure 4 – Current Status of the Associated Stations*

For all other problems, please contact Afrikanet or go on our website [www.afrikanet.net](http://www.afrikanet.net):

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6. Specification

<table>
<thead>
<tr>
<th>SYSTEM INFORMATION</th>
<th>Processor Specs</th>
<th>Atheros AR2313 SOC. MIPS 4KC, 180MHz</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Memory Information</td>
<td>16MB SDRAM, 4MB Flash</td>
</tr>
<tr>
<td></td>
<td>Networking Interface</td>
<td>10/100 BASE-TX (Cat. 5, RJ-45) Ethernet Interface</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>REGULATORY / COMPLIANCE INFORMATION</th>
<th>Wireless Modular Approvals</th>
<th>FCC Part 15.247, IC RSS210, CE</th>
</tr>
</thead>
<tbody>
<tr>
<td>RoHS Compliance</td>
<td></td>
<td>YES</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RADIO OPERATING FREQUENCY 5.475-5.825GHZ</th>
<th>TX SPECIFICATIONS</th>
<th>RX SPECIFICATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DataRate</td>
<td>Avg.Power</td>
</tr>
<tr>
<td></td>
<td>6Mbps</td>
<td>24 dBm</td>
</tr>
<tr>
<td></td>
<td>9Mbps</td>
<td>24 dBm</td>
</tr>
<tr>
<td></td>
<td>12Mbps</td>
<td>24 dBm</td>
</tr>
<tr>
<td></td>
<td>18Mbps</td>
<td>24 dBm</td>
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<tr>
<td></td>
<td>24Mbps</td>
<td>24 dBm</td>
</tr>
<tr>
<td></td>
<td>36Mbps</td>
<td>22 dBm</td>
</tr>
<tr>
<td></td>
<td>48Mbps</td>
<td>21 dBm</td>
</tr>
<tr>
<td></td>
<td>54Mbps</td>
<td>19 dBm</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ADJUSTABLE CHANNEL SIZE SUPPORT</th>
<th>5MHz</th>
<th>10MHz</th>
<th>20MHz</th>
<th>40MHz</th>
</tr>
</thead>
</table>

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### RANGE PERFORMANCE

<table>
<thead>
<tr>
<th>Outdoor (BaseStation Antenna Dependent)</th>
<th>Over 10km</th>
</tr>
</thead>
</table>

### INTEGRATED ADAPTIVE ANTENNA POLARITY + EXTERNAL ANTENNA SUPPORT (4 OPTIONS TOTAL)

<table>
<thead>
<tr>
<th>Gain</th>
<th>14dBi</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polarization</td>
<td>Multi-Polarized</td>
</tr>
<tr>
<td>Polarization Selection</td>
<td>Software Controlled</td>
</tr>
<tr>
<td>3dBi Beamwidth Azimuth</td>
<td>55 degrees</td>
</tr>
<tr>
<td>External Connector</td>
<td>RP-SMA</td>
</tr>
<tr>
<td>VSWR</td>
<td>1.4:1</td>
</tr>
<tr>
<td>Front to Back Ratio</td>
<td>30dB+</td>
</tr>
<tr>
<td>3dBi Beamwidth Elevation</td>
<td>18 degrees</td>
</tr>
</tbody>
</table>

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### PHYSICAL / ELECTRICAL / ENVIRONMENTAL

<table>
<thead>
<tr>
<th>Enclosure Size</th>
<th>26.4 cm x 8 cm x 3.4 cm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>0.4kg</td>
</tr>
<tr>
<td>Enclosure Characteristics</td>
<td>Outdoor UV Stabilized Plastic</td>
</tr>
<tr>
<td>Mounting Kit</td>
<td>Pole Mounting Kit included</td>
</tr>
<tr>
<td>Max Power Consumption</td>
<td>5 Watts</td>
</tr>
<tr>
<td>Power Supply</td>
<td>12V, 1A (12 Watts), Supply and injector included</td>
</tr>
<tr>
<td>Power Method</td>
<td>Passive Power over Ethernet (pairs 4,5+: 7.8 return)</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-20°C to +70°C</td>
</tr>
<tr>
<td>Operating Humidity</td>
<td>3 to 95% Condensing</td>
</tr>
<tr>
<td>Shock and Vibration</td>
<td>ETSI300-019-1.4</td>
</tr>
</tbody>
</table>

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### SOFTWARE

AirOS™ by Ubiquiti Networks

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