

BUFFALOTM

User Manual for Professional Firmware WZR-HP-G300NH

Nfiniti High Power Wireless N Router & Access Point



www.buffalotech.com

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1. Introduction

1.1. Welcome

This AirStation wireless router comes with two different firmware packages. You may use either the dd-wrt-based Professional firmware or the simple User-friendly firmware. By default, the Professional firmware is installed.

1.2. Device Configuration

From the factory, the router is configured as a network bridge. That means that all network interfaces can communicate with each other using this default bridge. The router is ready to use with a few simple adjustments.

1.2.1. Factory Settings

Because all interfaces are attached to the bridge by default, they all have the same IP configuration:

IP address	192.168.11.1
Subnet Mask	255.255.255.0
DHCP server	enabled
DHCP-Range	192.168.11.2 - 66

The Wireless LAN interface is activated by default with an SSID generated from the device's MAC address. For security, unused interfaces should be disabled. Wireless LAN interfaces that are not disabled should be configured with secure encryption (WPA2 or WPA is recommended) and a secure password.

1.2.2. Initial Operation

Connect your computer to the router with an Ethernet LAN cable and power the router on. It will take about 30 seconds to boot. You can then access it via telnet or web browser at the IP address 192.168.11.1. The DHCP server in the router is enabled by default. If your PC's Ethernet is configured for DHCP it should receive an IP address from the router's DHCP server. If not, please configure the Ethernet interface with an address from the 192.168.11.x subnet.

Because all relevant settings can be made using the web interface, this manual refers to configuration via the web GUI only.

2. Configuration via the Web Interface

The router contains an integrated web server that provides an easy to use web interface. It allows configuration, administration, and status checking in a simple but effective way.

When accessing the web GUI for the first time, change the default username and password. By default, the router's status page can be accessed without authentication, but this can be disabled.

The web interface was successfully tested on the following browsers:

- Internet Explorer 7.x and newer versions
- Firefox 2.x and newer versions
- Safari 2.x und newer versions

2.1. Preparation

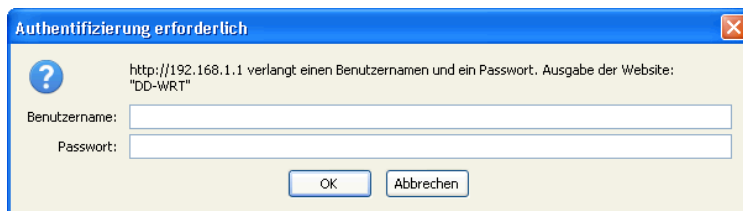
Connect your PC to the router and power the router on as described in 1.4.2. After the router has loaded its operating system, you can communicate with it via your LAN network interface.

The easiest way to test if your PC can communicate with the router is to ping 192.168.11.1.

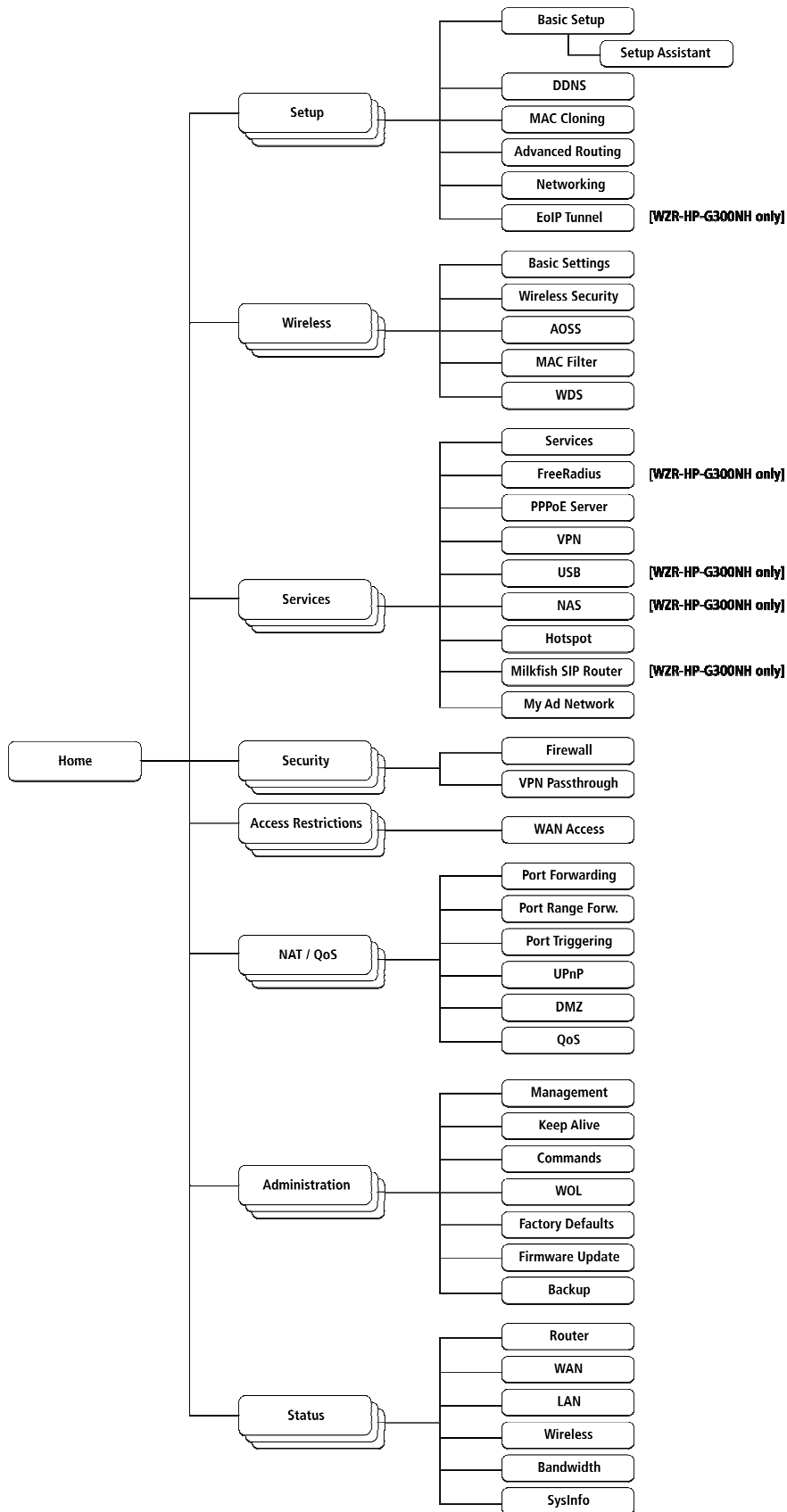
2.2. Web Interface Access

Open a browser window. Enter the address `http://192.168.11.1` into the address bar. The status page will be displayed.

When you click on a tab, the login window will pop up. Enter the username and password you previously set.



2.3. Web Interface Structure



2.3.1. Setup

2.3.1.1. Basic Configuration

Setup Assistant

The setup assistant provides a step-by-step interface for basic router configuration. This configures most common settings automatically.

WAN Setup

Here you'll find the most important settings to configure your internet access and WAN port. DHCP is enabled by default, but you can also use PPPoE, PPTP, L2TP, static IP, or HeartBeat Signal. If you don't use a password to log in to your ISP, you may need to enter "0000" for the password. Also, for some ISPs you should not enter the service name, as it will prevent establishing the connection. If you experience connection problems, then leave the service name empty.

WAN Connection Type	Description
Disabled	The WAN port is disabled.
Static IP	A static IP address will be used - enter the IP address, subnet mask, gateway, and server manually.
Automatic Configuration - DHCP	The router obtains its WAN-side IP address from a DHCP server.
PPPoE	Configure as PPPoE-client. For VDSL, check the "VDSL-Tagging" box.
PPTP	Establishes connection via PPTP.
L2TP	Establishes connection via L2TP.
HeartBeat Signal	If you use a HeartBeat connection, consult your ISP for setup information. HeartBeat Signal is used only in Australia.
3G/UMTS [WZR-HP-G300NH only]	Configures Internet Access via 3G/UMTS. Enable USB in the "Services" section and attach a 3g/UMTS USB stick to the router.

Network Setup

Network Setup configures the router's basic settings to match the local network. By default these settings are valid for all network ports except the WAN because they are all attached to the default bridge. If ports are disassociated from the bridge they will have different settings.

2.3.1.2. Dynamic DNS (DynDNS or DDNS)

Dynamic DNS allows the assignment of a DNS record to a dynamically assigned WAN-side IP address. A DynDNS client updates DNS records when your WAN-side IP address changes.

The router's firmware offers presets for the most common DynDNS services plus an option to define individual settings.

DynDNS Service	Description
Disabled	Default, no DynDNS
DynDNS.org	
freedns.afraid.org	
ZoneEdit.com	
No-IP.com	
3322.org	
easyDNS.com	
TZO.com	
DynSIP.org	
Custom	Individual DynDNS service configuration

2.3.1.3. MAC Address Cloning

MAC address cloning lets you assign a different MAC address to the router than the one encoded in the hardware.

2.3.1.4. Advanced Routing

Operating Mode

The default operating mode of the router is *Gateway*. Other routing protocols are available.

Modus	Description
Gateway	Gateway (default)
BGP	BGP Routing
Rip2 Router	Rip2 Routing
Router	Router

Static Routing

The Static Routing section lets you add static routes. The input parameters are equivalent to the parameters of the Linux command "route".

2.3.1.5. Networking

The Networking section allows detailed network configuration.

VLAN Tagging

Use this option to configure VLAN tagging.

Bridging

By default, one bridge (br0) is defined and active. In this section you can define additional bridges and change the interface assignment according to your requirements.

Bonding

Bonding offers the ability to "bond" interfaces together. Bonding can be used to enhance throughput or provide failover capabilities.

Port Setup

The port setup section allows further configuration of the routers network interfaces. Network interfaces can be separated from the bridge and it is possible to assign separate network settings for each interface. If an interface is separated from the bridge, add routing rules to allow communication between the interface and the bridge or other unbridged interfaces.

DHCPD

Besides the default DHCP server, you can define additional DHCP servers.

2.3.1.6. EoIP Tunnel [WZR-HP-G300-NH only]

EoIP (Ethernet over IP) tunnels can transport Ethernet data packages via a tunnel over existing IP connections. You can define up to 10 tunnels that can also be bonded.

2.3.2. Wireless

2.3.2.1. Basic Settings

Each Wireless LAN interface has its own section in the wireless basic settings screen. The wireless interfaces are labelled ath0 and ath0.1 - ath0.4 depending on the number of radios installed. To correctly identify the antenna connectors, please compare the MAC addresses printed on the enclosure with the addresses displayed in the web interface.

Wireless Mode

This parameter is used to define the operating mode of the Wireless LAN interface. You can select among the following modes:

Modus	Description
AP	WLAN Access Point mode (default)
Client	WLAN Client mode
Client-Bridge	Client-Bridge mode allows connecting to another Wireless LAN access point and establishing a network bridge with that access point
AdHoc	AdHoc operating mode, required for building mesh networks
WDS Station	WDS Station is the client in a WDS-AP <-> WDS station bridge. This is a special wireless networking mode that offers better flexibility and security than the classical MAC address based WDS.
WDS AP	WDS AP is the AP side for WDS AP <-> WDS Station. A WDS AP allows connections from WDS Stations and Wireless Clients.

Wireless Network Mode

Defines the IEEE802.11 networking mode.

Mode	Description
Disabled	Interface is disabled
Mixed	2.4 GHz 802.11b / 802.11g / 802.11n mixed mode
B-Only	2.4 GHz 802.11b mode (802.11g and 802.11n devices cannot connect)
G-Only	2.4 GHz 802.11g mode (802.11b, and 802.11n devices cannot connect)
BG-Mixed	2.4 GHz 802.11b & 802.11g mixed mode (802.11n devices cannot connect)
NG-Mixed	2.4 GHz 802.11n & 802.11g mixed mode (802.11b devices cannot connect)
N-Only (2.4 GHz)	2.4 GHz 802.11n mode (802.11a, 802.11b, and 802.11g devices cannot connect)

Channel Width

Some wireless network modes support wireless channel widths besides the standard 20 MHz. 802.11g & 802.11n offer the option to use 40 MHz channels for enhanced throughput. Both the AP and the client must support 40 MHz channels to use them.

Wireless Channel (AP only)

Set the desired wireless channel, or let the router choose a free channel automatically. If the router is in classic WDS (MAC address based) mode, then the wireless channel must be selected manually.

Wireless Network Name (SSID)

The name of the wireless network the radio transmits or connects to (depending on the wireless mode)

Wireless SSID Broadcast (AP only)

The name of the wireless network (SSID) may be broadcasted or not. Not broadcasting does not prevent the network from being detected by a wireless network sniffer; it just hides the name.

Advanced Settings

Check this box to get access to advanced wireless settings. These advanced parameters should be only modified by experienced users.

2.3.2.2. Wireless Security

Because wireless data packets can easily be sniffed, wireless connections require a greater level of security to ensure that data cannot be read by unauthorized users.

Security Mode

Mode	Description
Disabled	No encryption set (not recommended!)

WPA Personal	WPA encryption with a passphrase (text password)
WPA Enterprise (AP only)	WPA encryption with Radius Client authentication according to 802.1x
WPA2 Personal	WPA2 encryption with a passphrase (text password)
WPA2 Enterprise (AP only)	WPA2 encryption with Radius Client authentication according to 802.1x
WPA2 Personal Mixed	WPA & WPA2 encryption in WPA/WPA2 mixed mode with a passphrase (text password)
WPA2 Enterprise Mixed (AP only)	WPA & WPA2 encryption in WPA/WPA2 mixed with Radius Client authentication according to 802.1x
RADIUS	
WEP	WEP 64 Bit / 128 Bit encryption (insecure; not recommended!)
802.1x (Client only)	Client side mode to connect to AP's working with WPA Enterprise Modes via RADIUS authentication

When using WEP encryption (not recommended), the user can choose between 64 bit and 128 bit keys. Keys can be entered as passphrases that are used to generate the Hex keys. Theoretically 128 bit keys offer a higher level of security but because of design flaws, that's not the case in actual use.

Key length	Description
64 Bit (10 Hexadecimal characters)	Standard
128 Bit (26 Hexadecimal characters)	

With WPA or WPA2 encryption, there are several encryption algorithms to choose from. AES is more secure but TKIP is more widely supported. There is also a TKIP + AES setting, but that does not offer more security than TKIP.

Algorithm	Description
TKIP	TKIP encryption, supported by most clients devices
AES	AES encryption offers a better level of security but might not be supported by a number of client devices and requires less CPU processing power.
TKIP + AES	Mixed mode - offers best compatibility but doesn't work in all environments

If RADIUS security is used, the MAC address format has to be set accordingly.

RADIUS MAC format options	Description
aabbcc-ddeeff	Standard
aabbccddeeff	
aa:bb:cc:dd:ee:ff	
aa-bb-cc-dd-ee-ff	

2.3.2.3. AOSS

AOSS (AirStation One-touch Secure Setup) is Buffalo Technology's system to automatically connect wireless clients to an access point. AOSS can only be used in AP mode.

Enable AOSS

Enables the AOSS Service. When disabled, AOSS cannot be used.

Start AOSS Negotiation

To initiate AOSS, either click the AOSS button in the GUI or hold down the AOSS button on the front of the router for 3 seconds.

Security Modes

You may choose which security modes are offered in the AOSS negotiation process. The use of WEP in general is not recommended due to security concerns.

2.3.2.4. MAC Filter

The MAC Filter defines a list of client MAC addresses that are allowed to connect wirelessly. MAC addresses that aren't on the list aren't allowed to connect.

2.3.2.5. WDS

Wireless Distribution System (WDS) is a special access point mode that allows the connection of several access points to form a combined network. Such a network can be used to extend wireless network coverage.

The MAC addresses of the access points nearest to the current access point are entered as WDS nodes. Avoid creating "double" connections, i.e. A <-> B + A <-> B <-> C. These modes are available to connect WDS nodes:

WDS Client Mode	Description
disabled	Standard
Point-to-Point	Commonly used mode
LAN	

If WDS is enabled, then WDS NAT modes are also available.

WDS NAT Mode	Description
--------------	-------------

WLAN -> WDS	Standard
WDS -> WLAN	

2.3.3. Services

2.3.3.1. Services

The services section allows the configuration of basic service settings. Telnet and SSH can be configured this way. Remote access options are configured in the *Administration* section.

Available DHCP Server Domains	Description
WAN	Standard
LAN / WLAN	

Rflow / MACupd Interface Options	Description
LAN & WLAN	Standard
LAN	
WLAN	

2.3.3.2. FreeRadius [WZR-HP-G300NH only]

Certain applications (for example, Chillispot hotspot software) benefit from a RADIUS server for management of user credentials and settings.

Server Certificate

This section contains the parameters to generate the RADIUS server certificate. The certificate needs to be generated before clients can be configured to connect to the RADIUS server.

Certificate Status

Displays the server certificate creation status.

Settings

Choose the port that the RADIUS server uses for client communication. The default port is 1812.

Clients

This section is used to define RADIUS clients (required for HotSpot usage).

Users

Lists the users defined in the RADIUS servers. Allows creation and modification of accounts.

2.3.3.3. PPPoE Server

Some applications require a PPPoE server on the router, which can be configured here. The PPPoE server is disabled by default.

2.3.3.4. VPN

The router can also be configured as VPN server or VPN client.

PPTP

When defining the PPTP server's IP range, avoid overlap with the range of IP addresses handed out by DHCP if DHCP is enabled. The IP range is defined using the following syntax:

```
xxx.xxx.xxx.<start-ip>-<end-ip>
```

for example

```
192.168.1.20-30
```

Enter client login data follows:

```
<username> * <password> *
```

for example

```
testuser * test *
```

The encryption options can be set as follows

PPTP server type	Settings
DD-WRT Router	mppe required (Standard)
Windows PPTP Server	mppe required,no40,no56,stateless or mppe required,no40,no56,stateful

OpenVPN [WZR-HP-G300NH only]

OpenVPN is a powerful and flexible VPN solution. OpenVPN security is based on certificates that cannot be created on the router itself. Please refer to OpenVPN's online documentation for instructions on creating certificates and configuring OpenVPN.

2.3.3.5. USB [WZR-HP-G300NH only]

The router's USB port can be used for several purposes. Here the basic and advanced USB parameters are defined. Besides enabling USB and defining the USB hardware standard to use you can also define if printer and storage support for USB shall be enabled.

2.3.3.6. NAS [WZR-HP-G300NH only]

If USB hard drive support is enabled, you can start the integrated ProFTPD server to share data on an attached hard disk via FTP.

The User/Password data are entered as follows:

```
<username> * <password> *
```

for example

```
testuser * test *
```

Be careful enabling anonymous login. If anonymous login is enabled, everyone accessing your network has permission to read and write data.

2.3.3.7. Hotspot

Most hotspot software requires a server to store user settings and login information. Please note that Sputnik is a commercial hotspot service that requires an agreement with Sputnik for usage.

2.3.3.8. Milkfish SIP Router [WZR-HP-G300NH only]

This package is an implementation of the Milkfish SIP router.

2.3.3.9. My Ad Network

Allows the creation of an AnchorFree Hotspot that can be used to create revenue via AnchorFree.

2.3.4. Security

2.3.4.1. Firewall

Aside from enabling and disabling the firewall, you can also set additional filters, block certain network requests for the WAN interface, and manage logs.

2.3.4.2. VPN Pass-through

VPN settings effect how the firewall handles IPSec, PPTP, and L2TP connections. By default, pass-through is enabled. Please note that disabling pass-through will usually prevent you from establishing VPN connections from computers located in your local network to VPN servers on the internet.

2.3.5. Access Restrictions

2.3.5.1. WAN Access

The WAN access settings allow the definition of time and service related access rules.

2.3.6. NAT / QoS

2.3.6.1. Port Forwarding

Port forwarding allows the assigning of WAN ports to specific internal IP addresses and matching ports. Bidirectional external traffic can be forwarded to specific internal devices and computers. Each port forwarding entry defines a source port and a target IP address.

Before adding or removing a port forwarding entry, save all changed settings. Any changes not saved will be lost when a port forwarding entry is added or deleted.

2.3.6.2. Port Range Forwarding

Port range forwarding works similarly to port forwarding. Unlike port forwarding, instead of a single port, a range of ports is forwarded to the same range of ports at the internal target IP address.

2.3.6.3. Port Triggering

Port triggering is a kind of port range forwarding where outgoing traffic on specific ports enables previously defined port forwards for the activating device. This temporarily opens required ports when specific applications are opened on computers on the LAN. This offers a greater level of security than port forwarding or port range forwarding because the ports are only opened when needed.

2.3.6.4. UPnP

UPnP allows UPnP capable applications and devices to open and close required ports automatically as needed. This is simple to use and does not require further configuration steps.

2.3.6.5. DMZ

A DMZ computer is a special computer in the internal network that gets all incoming traffic forwarded. The task of that computer is managing this traffic. When the DMZ feature is activated the internal firewall is activated. This can pose a security issue if not handled with care. Furthermore, several services of the router, that have to be accessible from the WAN side, will not work because the associated traffic is forwarded to the DMZ computer.

2.3.6.6. QoS

QoS (Quality of Service) is a procedure to prioritise network traffic by application. Specific services can be assigned specific bandwidth.

Aside from upstream and downstream bandwidth, you can define settings for specific services and IP and MAC address ranges.

2.3.7. Administration

2.3.7.1. Management

The Management section contains settings for remotely accessing the router and other basic settings that are usually not changed. The settings for the language used in the Web GUI are also located here. You may choose between Chinese (simplified & traditional), Dutch, French, German, Hungarian, Italian, Japanese, Polish, Portuguese, Slovenian, Spanish, and Swedish. The default setting is English.

Before using Telnet or SSH, activate the associated service(s) in this section.

2.3.7.2. Keep Alive

Keep-Alive lets you configure monitoring options that automatically reboot the router if a service malfunction causes it to fail to respond.

2.3.7.3. Commands

Entering Linux commands is one of the most powerful ways to access the router's functionality. This enables you to access services and configure options that are not accessible via the Web GUI. Using shell commands can lead to unexpected results. Use them with utmost care.

Aside from executing the shell commands directly you can also save custom start up and firewall scripts.

2.3.7.4. WOL

With Wake-on-LAN, you can send special data packets to compatible devices on your LAN, causing them to exit sleep mode.

WOL data packets can be triggered manually or scheduled automatically.

2.3.7.5. Factory Defaults

With this feature you can reset the router's settings to factory defaults. After a reset, the router will restart.

2.3.7.6. Firmware Upgrade

The firmware upgrade option can be used to install a different firmware version. When doing this you can choose if the router's settings will be restored to factory defaults or kept.

2.3.7.7. Backup

You can use this feature to store your current configuration into a backup file, or to restore from a previously stored configuration. This also makes it simple to set up a number of routers with the exact same configuration.

2.3.8. Status

2.3.8.1. Router

The status screen displays information about the router, such as cpu load, memory consumption, and currently active IP connections. Status is updated automatically.

2.3.8.2. WAN

If the WAN interface is enabled, this screen displays WAN settings and throughput statistics.

2.3.8.3. LAN

Here you can find LAN-related information like active clients and DHCP clients.

2.3.8.4. Wireless

The wireless LAN status screen displays the current wireless LAN interface configuration, wireless LAN clients (in AP modes), and access points (in client modes). If there's more than one wireless LAN interface, you can switch between them via the interface pull down menu.

2.3.8.5. Bandwidth

Bandwidth monitoring displays real time diagrams for incoming and outgoing traffic for each network interface.

2.3.8.6. SysInfo

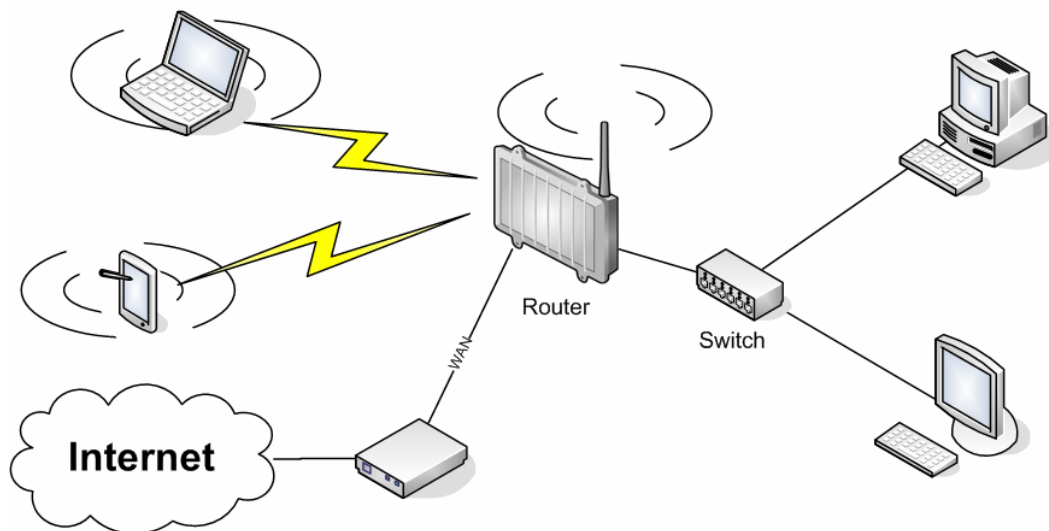
The SysInfo screen combines the most important information of the other status pages. By default, the SysInfo page can be accessed from LAN devices without authentication. That can be changed in the *Management* section of the *Administration* area.

3. Use Cases

The following use cases relate to the most commonly used router configurations. The related router configuration is explained step by step.

3.1. Access Point

Access Point (AP, sometimes also called "Infrastructure Mode") is the mode where the router is also the central wireless hub that connects to the LAN and provides access to wireless devices. These wireless clients of the AP can communicate with each other and with wired devices on the network such as the Internet.



Connect your computer to the router as described in 2.1. and access the web interface according to 2.2.

3.1.1. Access Point with NAT / DHCP

Setup -> Basic Setup

- *WAN Setup*
 - In "Connection Type", choose the type of WAN connection you want to use and complete the related settings.
- *Network Setup*
 - Enter the desired LAN IP address for the router into "Router IP".
 - Set "DHCP Type" to "DHCP Server" (this is the default).
 - "Enable" DHCP Server (this is the default).
 - Adjust the DHCP address range to match your requirements.
- *Time Settings*
 - Choose your time zone.
- Click "Save".

Wireless -> Basic Settings

- Enter your country in "Regulatory Domain"
- In the "Antenna Gain" field, please enter the gain of the antenna on your router. The firmware will adjust the transmit power accordingly to meet regulatory requirements. Please keep in mind that very long cables can dampen the HF signal thus reducing the usable antenna gain.
- Configure "Wireless Mode" to "AP"
- Set your desired wireless mode in "Wireless Network Mode". Please note that mixed modes will lead to reduced performance because of maintaining compatibility.
- Enter a name for your wireless network into "Wireless Network Name (SSID)"
- Click "Save"

Wireless -> Wireless Security

- Choose and configure a security mode. Please note that WEP is insecure and should only be used if no other option is available.
- Click "Apply Settings"

You can now connect the router to the Internet and your local network. After you successfully connect wireless devices, they will then be displayed on the "SysInfo" and "WLAN Status" pages.

3.1.1. Access Point attached to a network / Internet gateway

Setup -> Basic Setup

- *WAN Setup*
 - For "Connection Type", choose "Disabled".
- *Network Setup*
 - Enter the desired LAN-side IP address for the router into "Router IP".
 - Set the "DHCP Type" to "DHCP Server" (this is the default).
 - "Disable" "DHCP Server".
- *Time Settings*
 - Choose your time zone.
- Click "Save".

Wireless -> Basic Settings

- Enter your country in "Regulatory Domain"
- In the "Antenna Gain" field, please enter the gain of the antenna on your router. The firmware will adjust the transmit power accordingly to meet regulatory requirements. Please keep in mind that very long cables can dampen the HF signal thus reducing the usable antenna gain.
- Configure "Wireless Mode" to "AP"
- Choose a wireless mode in "Wireless Network Mode". Please note that mixed modes will lead to reduced performance because of maintaining compatibility.

- Enter a name for your wireless network into "Wireless Network Name (SSID)".
- Click "Save".

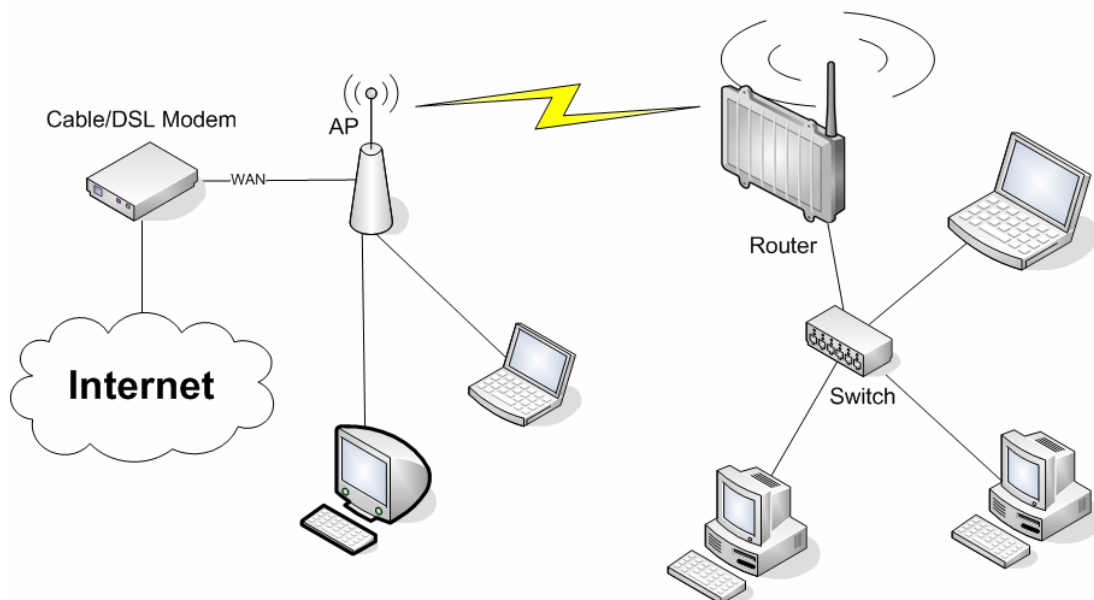
Wireless -> Wireless Security

- Choose and configure your desired security mode. Please note that WEP is insecure and should only be used if no other option is available.
- Click "Apply Settings"

You can now connect the router to the Internet and your local network. If you're running a DHCP server in your LAN, connected wireless devices will get their IP addresses from the server.

3.2. Wireless Client

The router can be also used as a wireless LAN client. This can be useful if you want to connect devices to your wireless LAN that do not have a wireless LAN interface. In this configuration, the wireless LAN interface acts as a wireless client. Attached wired Ethernet devices can also access the WAN through the wireless connection.



Setup -> Basic Setup

- *WAN Setup*
 - Set "Connection Type" to "DHCP" to have the AirStation get its IP address from a DHCP server, or to a "Static IP" if no DHCP server is available.
- *Network Setup*
 - Enter the desired LAN-side IP address for the router in "Router IP".
 - Set the "DHCP Type" to "DHCP Server" (this is the default setting).
 - "Enable" "DHCP Server" (this is the default setting).

- o Adjust the DHCP address range to match your requirements.
- *Time Settings*
 - o Choose your time zone.
- Click "Save".

Wireless -> Basic Settings

- Enter your country in "Regulatory Domain"
- In the "Antenna Gain" field, please enter the gain of your AirStation's antenna. The firmware will adjust the transmit power automatically to meet regulatory requirements. Please note that the use of a long extension cable for your antenna will reduce the usable antenna gain.
- Configure "Wireless Mode" to "Client".
- Configure "Wireless Network Mode" to match the capabilities of the access point you want to connect to.
- Enter the network name (SSID) of the AP you want to connect to into "Wireless Network Name (SSID)".
- Click "Save".

Wireless -> Wireless Security

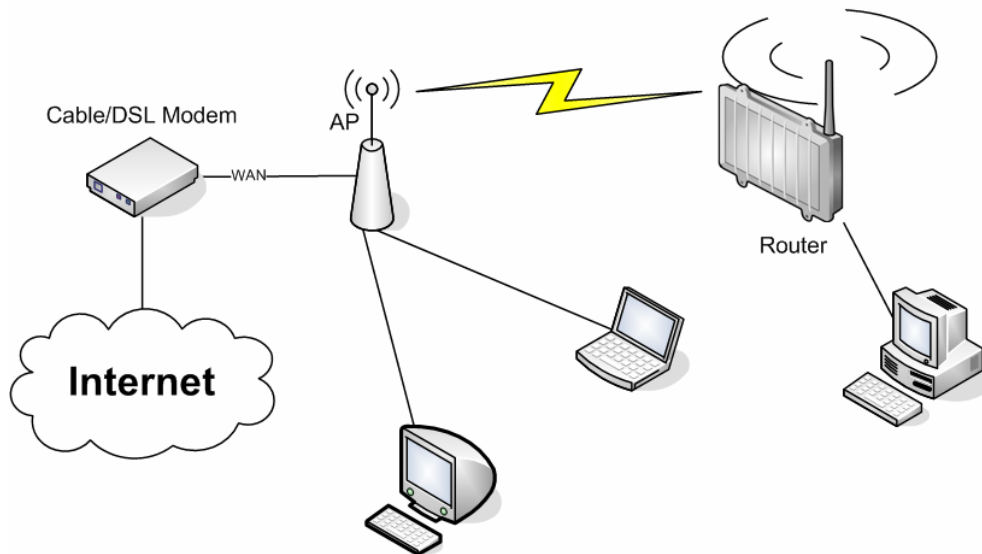
- Configure the security mode to match the security settings of the access point you want to connect to.
- Click "Apply Settings".

After the router reboots, please confirm that it has connected to the access point. If there is a DHCP server available on the access point side, and the router is configured to request an IP address, then it should receive an IP address for its WAN-side interface.

You can now either connect wired clients to the access point or configure another wireless network interface as an access point to grant access to wireless clients.

3.3. Wireless Client Bridge

A wireless client bridge offers the ability to transparently integrate the router's LAN into a different LAN that another access point is connected to. Clients connected to such a router can access devices in both LANs and vice versa. In that configuration the router's WAN interface is disabled.



Setup -> Basic Setup

- *WAN Setup*
 - Choose "Disabled" for "Connection Type" (this will be set automatically).
- *Network Setup*
 - Enter the desired LAN-side IP address for the router into "Router IP".
 - "Disable" "DHCP Server".
- *Time Settings*
 - Choose your time zone.
- Click "Save".

Wireless -> Basic Settings

- Enter your country in "Regulatory Domain".
- In the "Antenna Gain" field, please enter the gain of your AirStation's antenna. The firmware will adjust the transmit power automatically to meet regulatory requirements. Please note that the use of a long extension cable for your antenna will reduce the usable antenna gain.
- Configure "Wireless Mode" to "Client Bridge".
- Set "Wireless Network Mode" to match the access point you want to connect to.
- Enter the network name (SSID) of the AP you want to connect to.
- Click "Save".

Wireless -> Wireless Security

- Configure security to match the security settings of the access point you want to connect to.
- Click "Apply Settings".

After the router reboots, please confirm that it has connected to the access point. If there is a DHCP server available on the access point

side, a pc in the router's LAN configured to request an address from DHCP should receive an IP address.

3.4. FTP Server

The router can be used as an FTP server when a USB disk (such as a hard disk or flash memory device) is connected to the USB port on the rear of the router.

3.4.1. Examples

Services -> USB

Make the settings in the USB Support section, and click [Apply Settings].

Examples:

Core USB Support	Enabled
USB 1.1 Support (UHCI)	Enabled
USB 1.1 Support (OHCI)	Enabled
USB 2.0 Support	Enabled
USB Storage Support	Enabled
ext2 / ext3 File System Support	Enabled
FAT File System Support	Enabled
Automatic Drive Mount	Enabled
Run-on-mount Script Name	blank
Disk Mount Point	/mnt

·Connect a USB disk to the router.

After a short wait, the disk information is displayed in the Disk Info section.

```

Disk Info
---- /dev/discs/disc0/disc
Block device, size 496 MiB (520093696 bytes)
Windows NTLDR boot loader
DOS/MBR partition map
Partition 1: 496.0 MiB (520061952 bytes, 1015746 sectors from 62)
Type 0x0B (Win95 FAT32)
FAT32 file system (hints score 5 of 5)
Volume size 495.0 MiB (519028736 bytes, 126716 clusters of 4 KiB)
Volume name ""
FAT32 file system (hints score 4 of 5)
Volume size 495.0 MiB (519061504 bytes, 126724 clusters of 4 KiB)
Status: Mounted on /mnt
  
```

Services -> NAS

·Make the settings in the ProFTPD section, and click [Apply Settings].

Setting example:

ProFTPD	Enable
Server Port	21
Files Directory	/mnt
Allow Write	Enable
User Password List	buffalo 12345678
Anonymous Login (Read-only)	Disable

*The user name (example: buffalo) and password (example: 12345678) are separated by a space.

3.4.2. Logging into the FTP server

- Open a command prompt window.
- Enter "ftp 192.168.11.1" to access the FTP server.
- Enter the user name, and press the Enter key.
- Enter the password, and press the Enter key.
- When the login is successful, "ftp>" appears on the screen.
- To logout, enter the "bye" command.

```
Microsoft Windows [Version 6.1.7600]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Users\John>ftp 192.168.11.1
Connected to 192.168.11.1.
220 ProFTPD 1.3.3 Server (DD-WRT) [192.168.11.1]
User (192.168.11.1:(none)): buffalo
331 Password required for buffalo
Password:
230 User buffalo logged in
ftp>
```

3.4.3. Common FTP commands

Command	Description	Entry example
ftp	Starts FTP	ftp
ls	Displays a list of the remote directory's files	ls
pwd	Displays the current directory on the remote computer	pwd
cd	Changes the current working directory on the remote computer	cd img
mkdir	Creates a remote directory	mkdir test
rmdir	Deletes a remote directory	rmdir test
lcd	Changes the current working directory on the local computer	lcd E:\test
asc	Switches to ASCII transfer mode	asc
bin	Switches to binary transfer mode	bin
put	Uploads a file to the remote computer	put test.pdf
mput	Uploads multiple files to the remote computer	mput test1.jpg test2.jpg test3.jpg
get	Downloads a file to the local computer	get index.html
mget	Downloads multiple	mget test1.jpg

	files to the local computer	test2.jpg test3.jpg
delete	Deletes a file on the remote computer	delete test1.jpg
mdelete	Deletes multiple files on the remote computer	mdelete test1.jpg test2.jpg test3.jpg
rename	Renames a file on the remote computer	rename test1.jpg new1.jpg
help	Displays the Help for FTP commands	help
bye	Exits FTP	bye

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