

# DWC-1000 /2000 optimized 5GHz & 2.4GHz Wireless Settings

## [requirements]

1. Unified Wireless Controller/Switch with latest firmware version: **4.7.1.1** and newer  
*(this settings are also valid for DWS-4026 (FW 4.3.x and newer) & DWS-3160 (FW 4.4.x and newer), the webgui menu structure will differ from the ons of the DWC-1000/2000)*

2. compatible AP with latest firmware

[ftp://ftp.dlink.de/dwc/dwc-1000/driver\\_software/](ftp://ftp.dlink.de/dwc/dwc-1000/driver_software/)

[ftp://ftp.dlink.de/dwc/dwc-2000/driver\\_software/](ftp://ftp.dlink.de/dwc/dwc-2000/driver_software/)

[ftp://ftp.dlink.de/dws/dws-3160-24pc/driver\\_software/](ftp://ftp.dlink.de/dws/dws-3160-24pc/driver_software/)

[ftp://ftp.dlink.de/dws/dws-3160-24tc/driver\\_software/](ftp://ftp.dlink.de/dws/dws-3160-24tc/driver_software/)

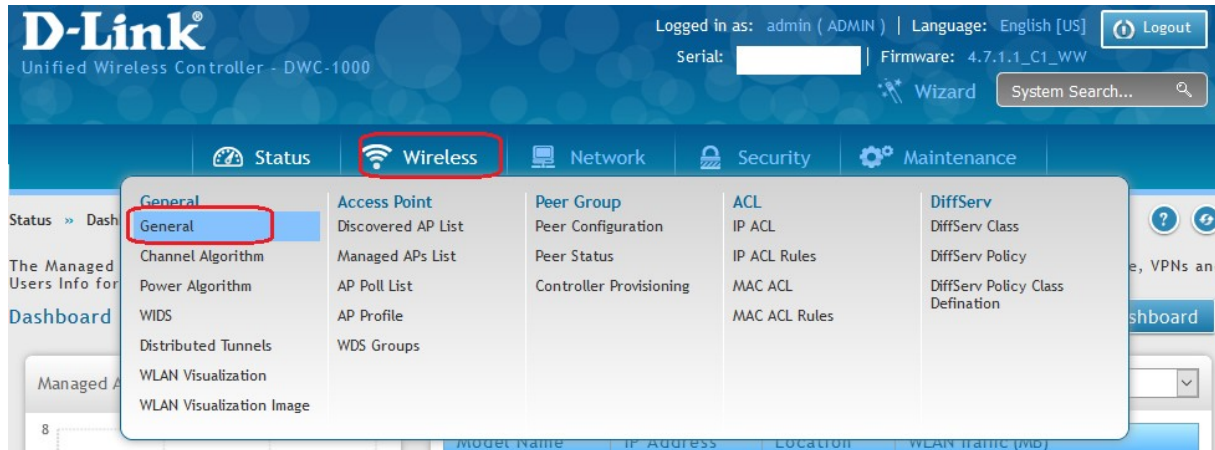
[ftp://ftp.dlink.de/dws/dws-4026/driver\\_software/](ftp://ftp.dlink.de/dws/dws-4026/driver_software/)

**[setup]**

Open the WebGUI of the DWC-1000/2000 and login

1.)

Navigate to the Submenu > wireless > general



Modify the values according to your setup:

- |                                 |  |
|---------------------------------|--|
| Peer Address Group              | = defines the peer group in which you can peer several DWC's   |
| Client Roam Timeout             | = 15   |
| Ad Hoc Client Status Timeout    | = 1  |
| AP Failure Status Timeout       | = 1  |
| RF Scan Status Timeout          | = 1  |
| Detected Clients Status Timeout | = 1  |
| Cluster Priority                | = defines the priority of the local device within the peer/cluster group, the device with the highest priority (255) will become the peer-master |
| Country Code                    | = defines the wireless country code for your country/region  |

### WLAN Global Setup

IP Address	192.168.10.9
Peer Group ID	<input type="text" value="1"/> [Default: 1, Range: 1 - 255]
Hardware Version Compatibility	<input checked="" type="checkbox"/> ON <input type="checkbox"/> OFF
Client Roam Timeout	<input type="text" value="15"/> [Range: 1 - 120] Seconds
Ad Hoc Client Status Timeout	<input type="text" value="1"/> [Range: 0 - 168] Hours
AP Failure Status Timeout	<input type="text" value="1"/> [Range: 0 - 168] Hours
Client MAC Authentication Mode	<input checked="" type="radio"/> White-list <input type="radio"/> Black-List
RF Scan Status Timeout	<input type="text" value="1"/> [Range: 0 - 168] Hours
Detected Clients Status Timeout	<input type="text" value="1"/> [Range: 0 - 168] Hours
Tunnel IP MTU Size	<input checked="" type="radio"/> 1500 <input type="radio"/> 1520
Cluster Priority	<input type="text" value="255"/> [Range: 0 - 255]
Detected Clients Delete	<input checked="" type="checkbox"/> ON <input type="checkbox"/> OFF
Detected Clients Delete Timeout	<input type="text" value="10"/> [Range: 10 - 999] Minutes
AP Client QoS	<input checked="" type="checkbox"/> ON <input type="checkbox"/> OFF
Radius Authentication Server	<input type="text" value="Default-RADIUS-Server"/>
Radius Authentication Server Status	Configured
Radius Accounting Server	<input type="text" value="Default-RADIUS-Server"/>
Radius Accounting Server Status	Configured
Global Accounting Mode	<input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF

### AP Validation

AP MAC Validation	<input checked="" type="radio"/> Local <input type="radio"/> Radius
Require Authentication Passphrase	<input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF
Manage AP with Previous Release Code	<input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF

### Mutual Authentication

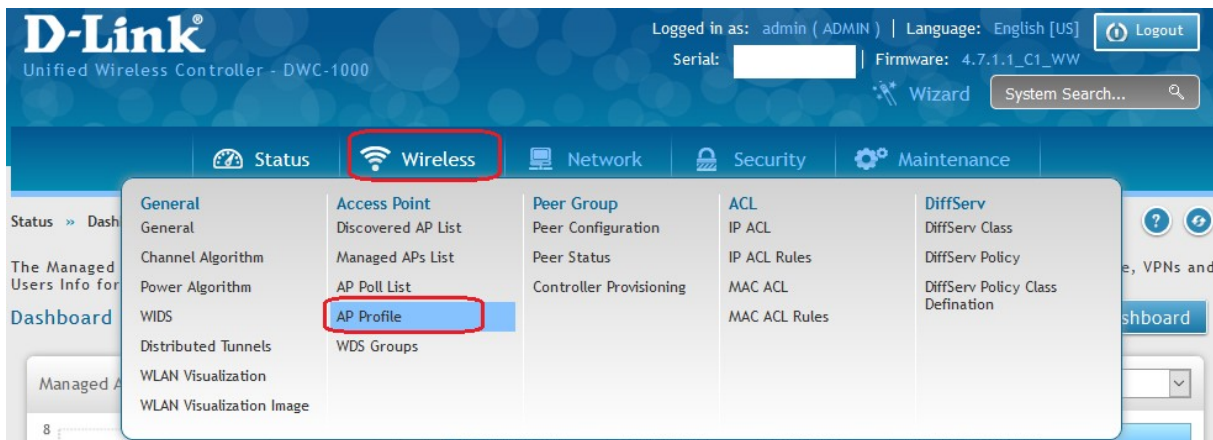
Controller Provisioning Mode	<input checked="" type="checkbox"/> ON <input type="checkbox"/> OFF
Network Mutual Authentication Mode	<input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF
Unmanaged AP Reprovisioning Mode	<input checked="" type="checkbox"/> ON <input type="checkbox"/> OFF

### Country Configuration

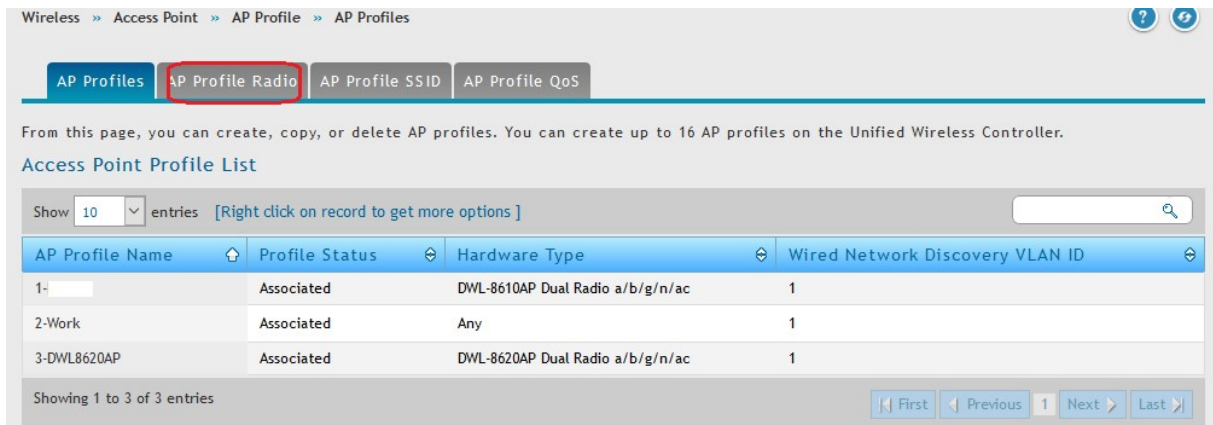
Current Country Code	<input type="text" value="DE - Germany"/>
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2.)

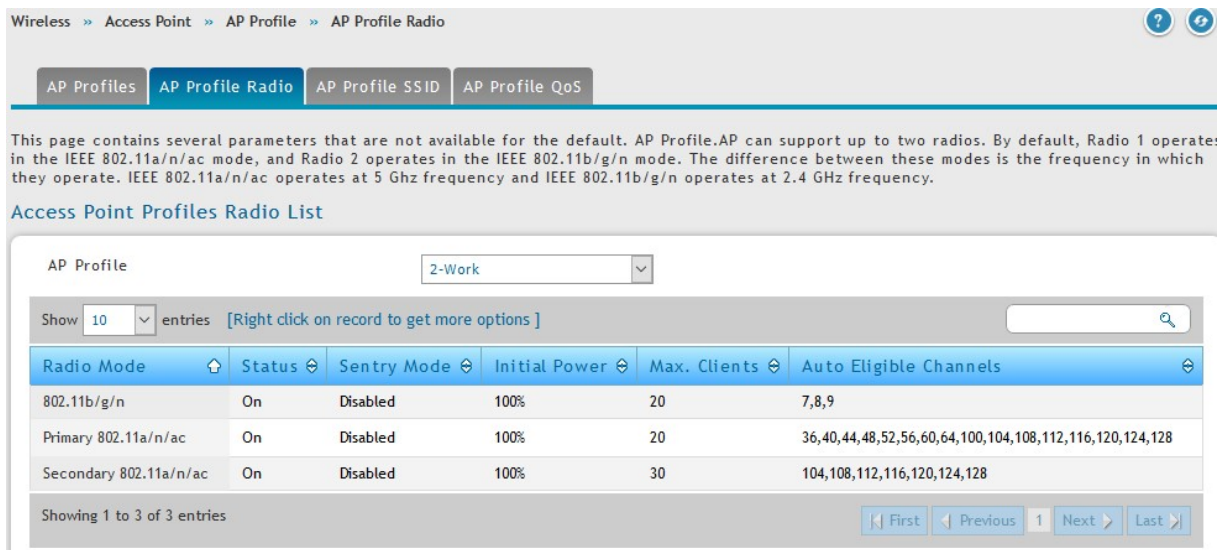
Navigate to the Submenu > Wireless > AP Profile



Open the Menu > AP Profile Radio,



If you did create several AP-Profiles so you now can chose and edit the radio frequency for each AP-Profile using the right mouse button => edit



## 2,4 & 5 GHz Band/Radio (example settings for 2.4 GHz radio)

The image displays three sequential screenshots of the 'AP Profile Radio Configuration' web interface, showing different sections of the configuration page. Each screenshot has a red box on the right side, likely indicating a scroll bar or a specific area of interest.

**AP Profile Radio Configuration**

*Radio Configuration*

State	<input checked="" type="checkbox"/> ON
Radio Scheduler	Scheduler Off
RTS Threshold	2347 [Range: 0 - 2347] Bytes
Load Balancing	<input type="checkbox"/> OFF
Maximum Clients	20 [Range: 0 - 200]
RF Scan Other Channels	<input checked="" type="checkbox"/> ON
RF Scan Sentry	<input type="checkbox"/> OFF
Mode	2.4GHz IEEE 802.11n
DTIM Period	10 [Range: 1 - 255] Beacons
Beacon Interval	75 [Range: 20 - 200] M. Sec.
Automatic Channel	<input checked="" type="checkbox"/> ON

**AP Profile Radio Configuration**

Automatic Power	<input checked="" type="checkbox"/> ON
Initial Power	100 [Range: 1% - 100%]
Minimum Power	100 [Range: 1% - 100%]
APSD Mode	<input checked="" type="checkbox"/> ON
RF Scan Interval	60 [Range: 30 - 120] Seconds
Frag Threshold	2346 [Range: 256 - 2346] Bytes
Short Retries	7
RF Scan Duration	10 [Range: 10 - 2000] M. Sec.
Long Retries	4
Rate Limiting	<input checked="" type="checkbox"/> ON
Transmit Lifetime	512
Rate Limit	30 [Range: 1 - 50] Pkts/Sec

**AP Profile Radio Configuration**

Receive Lifetime	512
Rate Limit Burst	40 [Range: 1 - 75] Pkts/Sec
Station Isolation	<input type="checkbox"/> OFF
Channel Bandwidth	<input checked="" type="radio"/> 20 MHz <input type="radio"/> 40 MHz
Primary Channel	<input checked="" type="radio"/> Lower
Protection	<input checked="" type="radio"/> Auto <input type="radio"/> Off
Short Guard Interval	<input checked="" type="checkbox"/> ON
Space Time Block Code	<input checked="" type="checkbox"/> ON
Radio Resource Management	<input checked="" type="checkbox"/> ON
No ACK	<input type="checkbox"/> OFF
Force Roaming	<input type="checkbox"/> OFF
Multicast Tx Rate (Mbps)	6



AP Profile Radio Configuration

Force Roaming  OFF

Multicast Tx Rate (Mbps)

**Channels**

Auto Eligible Channels

Basic Rate Set (Mbps)

Supported Rate Set (Mbps)

Multicast to Unicast  OFF

DHCP Offer/ ACK to Unicast  OFF

RTS Threshold = 2347  
 Maximum Clients = 20 (this limit is for each radio on each AP)  
*[a concurrent dualband AP like DWL-8610AP has 2 radios, so the maximum in 5GHz is 20 Clients and if set the same value in 2.4 GHz, then it is 20 Clients there too. Total Client maximum is then for this example AP 40 Clients]*

RF Scan Other Channels = Disable  
 Mode = defines the WLAN mode f.e. 802.11 a/n/ac  
*[if set to latest IEEE Wireless mode all managed APs always will act to the maximum of their hardware capabilities, so by defining the latest IEEE802.11 a/n/ac in 5 GHz radio also support normal 5GHz IEEE802.11a/n APs like DWL-6600]*

Beacon Interval = 75ms  
 Automatic Channel = ON  
 Automatic Power = ON  
 Initial Power = transmit power of the AP after reboot (f.e. 80%)  
 Minimum Power = the minimum transmit power of the AP which can't be lower than the defined minimum (f.e. 60%)

*[If you use Auto Power please check your AP-placement and modify this values for your dedicated setup, since this function is not intended for the client's wireless coverage. So it may required to set both values to 100%, depending of your installation and environment. Especially if you have high ceilings or place the APs behind dry walls it will be required to set the transmit power to 100%.]*

APSD Mode = Enable  
 Frag Threshold = 2346  
 Rate Limiting = ON  
 Rate Limit = 30  
 Rate Limit Burst = 40  
 Station Isolation = ON

*[if you use station isolation please be noted, that this is working for all SSID's inside the AP-Profile but only within the same radio, it is not working in between both radios ]*

Channel Bandwidth = 20, 40, 80, 80+80, 160 MHz  
*[defines the useable channel bandwidth, wider channel will provide higher throughput, but lesser channel to select]*

Space Time Block Code (STBC) = ON  
*[disabling this option will result in a slightly higher data throughput, also some old clients might be able to connect to the wireless  
Disabling the STBC option also means that the AP will not send the data to the client with a time difference and from different antennas to ensure data integrity. ]*

Force Roaming = ON/OFF  
*[the APs will try to support the client initiated roaming behavior by checking the signal and SNR of the client, if the AP decides that the client should roam, the AP will send an disassociate packet to the client  
IF you use this option you must make sure, that the wireless coverage is overlapping and please be advised, that the clients might be disconnected at the corner of the wireless are.  
We advise you to be careful with this special option. ]*

Channels = the available channels for auto channel selection  
Basic Rate Set / Supported Rate Set = The Basic Rate set is the rate that all clients that want to associate with a AP must support. For backward compatibility with 802.11b clients, the Basic Rate set is generally 1, 2, 5.5 and 11Mbps. This information is transmitted by the AP as mandatory rates in the Supported Rates element of various management frames.

*With the save button you save your settings.*

In general and high interference wireless areas we also recommend to disable the obsolete IEEE 802.11b/g wireless standard for 2.4 GHz.

This will enable you to use in high interference areas the non-overlapping channels 1, 5, 9 & 13 (11).

RTS Threshold = 1173  
Beacon Interval = 75ms  
Frag Threshold = 586  
Channel Bandwidth = 20 MHz  
Channels = 1 + 5 + 9 + 13 (11)

In general and low interference wireless areas we also recommend to disable the obsolete IEEE 802.11b/g wireless standard for 2.4 GHz.

This will enable you to use in high interference areas the non-overlapping channels 1, 5, 9 & 13.

RTS Threshold = 2347  
Beacon Interval = 75ms  
Frag Threshold = 2346  
Channel Bandwidth = 40 MHz  
Channels = 1 + 7 (lower primary channel)

For 5 GHz radio we recommend to use the same settings from 2.4 GHz radio according to the wireless interferences.

The main difference is the channel Bandwidth in 5 GHz which is 80MHz mandatory for IEEE802.11ac and 80+80 or 160MHz for IEEE802.11ac Wave2 (DWL-8620AP).

Due to the channel Bandwidth and the availability of non-overlapping channels it is strongly recommended to use either 80MHz or 80+80 MHz instead of 160MHz channels.

Channel Bandwidth = 80, 80+80, 160 MHz

Modifying the Basic/Supported Rate Set will also influence the roaming behavior of your wireless clients.

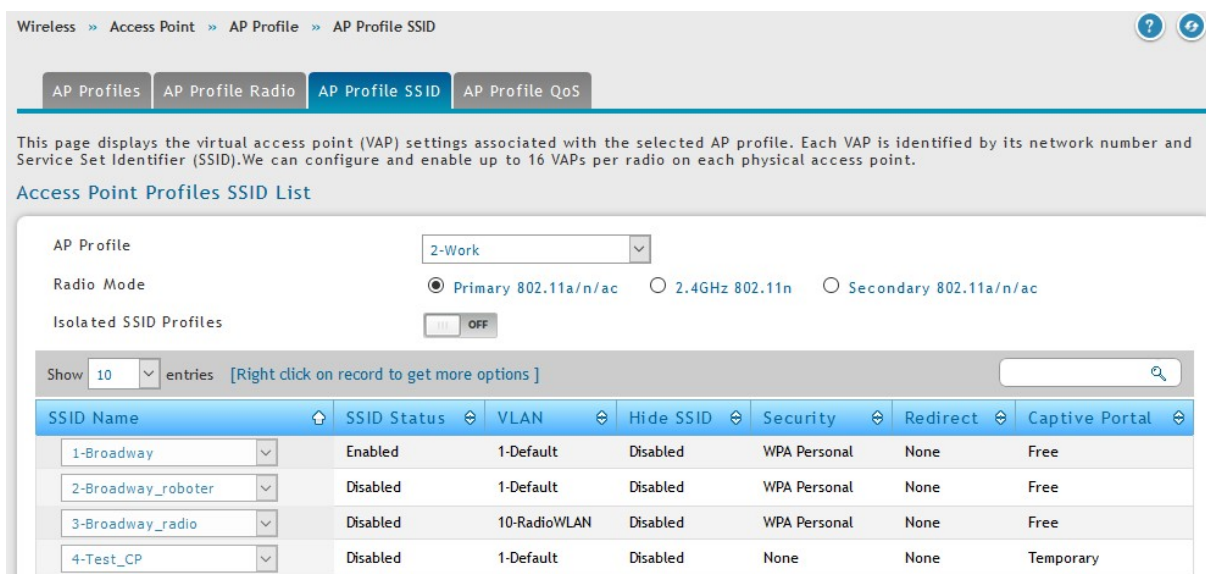
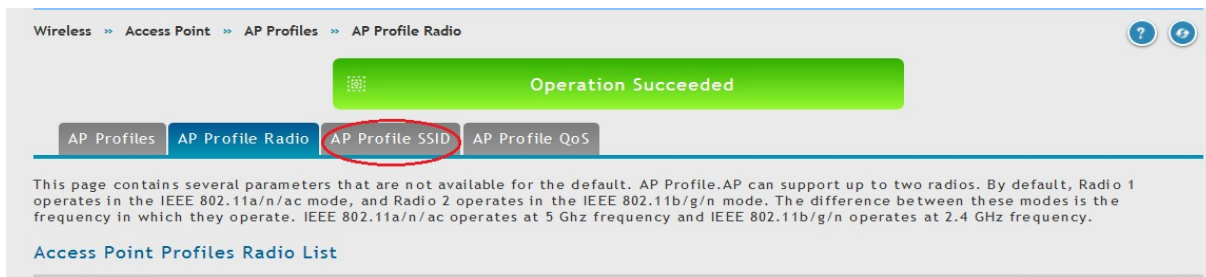
If you f.e. disable all Basic/Supported Rate Set 1, 2, 5.5 and 6 the Client will usually roam earlier but also the clients at the verge of the wireless network might have issues connecting to the wireless network.

If you have a triple band AP like DWL-7620AP, please modify the secondary 5 GHz Radio too.



3.) optimization when using WPA2-AES encryption.

Navigate to the Submenu > Wireless Access Point > AP Profiles > AP Profiles SSIDs



Choose the SSID you want to modify by clicking right mouse and selecting edit.

(the SSID settings are a global variable, no matter in which AP Profile the SSID is being transmitted)

**In roaming environments and where a stable connection is required, we do recommend not to use BandSteering and not the same SSID on both radios simultaneously.**

**If you need or want a BandSteering setup, please ensure on your wireless client, that they do not change the radio instead of roaming in between 2 or more APs.**

WPA2 = enable  
WPA AES = enable  
Bcast Key Refresh Rate = 300

Please only activate WPA2 & CCMP (AES) since this is compliant with current IEEE standard and only this will enable you to use the maximum throughput possible.

With the save button you save your settings.

Navigate to the Submenu > Wireless Access Point > AP Profiles

Wireless >> Access Point >> AP Profile >> AP Profiles

AP Profiles | AP Profile Radio | AP Profile SSID | AP Profile QoS

From this page, you can create, copy, or delete AP profiles. You can create up to 16 AP profiles on the Unified Wireless Controller.

Access Point Profile List

Show 10 entries [Right click on record to get more options]

AP Profile Name	Profile Status	Hardware Type	Wired Network Discovery VLAN ID
1-.....	Associated	DWL-8610AP Dual Radio a/b/g/n/ac	1
2-Work	Associated - Modified	Any	1
3-DWL8620AP	Associated	DWL-8620AP Dual Radio a/b/g/n/ac	1

Showing 1 to 3 of 3 entries

First Previous 1 Next Last

With the right mouse click and then Apply you will transmit your modification to all associated/managed APs of this dedicated AP Profile.

When using Auto-Power and Auto-Channel selection in AP Profile please ensure that you also configure the options in RF-management.

Wireless > Channel Algorithm

Wireless >> General >> Channel Algorithm

Wireless | Status | **Wireless** | Network | VPN | Security | Maintenance

General | **Channel Algorithm** | Power Algorithm | WIDS | Distributed Tunnels | WLAN Deployment | WLAN Visualization

Access Point | Peer Group | ACL | DiffServ

Discovered AP List | Peer Configuration | IP ACL | DiffServ Class

Managed APs List | Peer Status | IP ACL Rules | DiffServ Policy

AP Poll List | MAC ACL | DiffServ Policy Class

AP Profile | MAC ACL Rules | Defination

SSID Profiles

WDS Groups

Wireless >> General >> Channel Algorithm >> Channel Algorithm 5 GHz

Channel Setting | Manual Channel Plan | Channel Plan History

Through this page we can configure AP frequency related parameters for 5 GHz radio channel.

5 GHz | 2.4 GHz

RF Channel 5 GHz Settings

Radio: 5 GHz (802.11 a/n)

Channel Plan Mode:  Manual  Interval  Fixed Time

Channel Plan Fixed Time:  [Range: 00:00 - 23:59] Hours and Seconds

Ignore Unmanaged Aps:  OFF

Channel Change Threshold:  [Default: -82, Range: -99 to -1]

Managed AP CH Conflict Threshold:  [Default: -56, Range: -99 to -1]

Save Cancel

Wireless » General » Channel Algorithm » Channel Algorithm 2.4 GHz

Channel Setting | Manual Channel Plan | Channel Plan History

Through this page we can configure AP frequency related parameters for 2.4 GHz radio channel.

5 GHz | 2.4 GHz

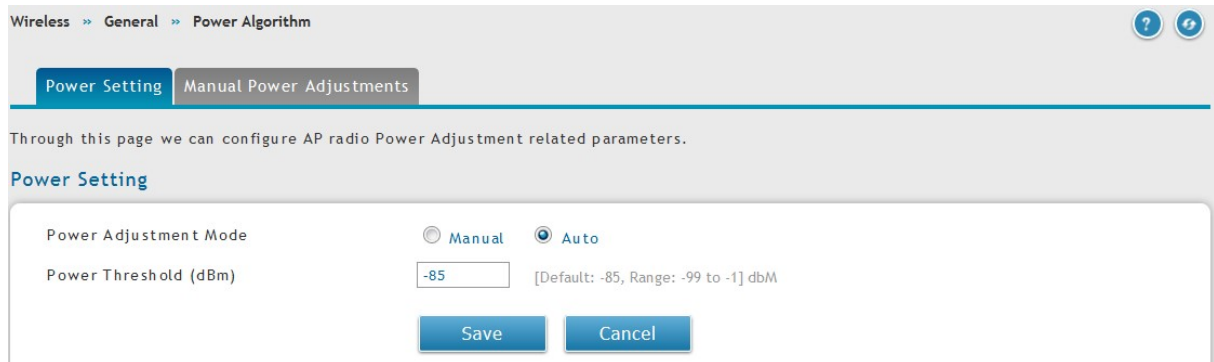
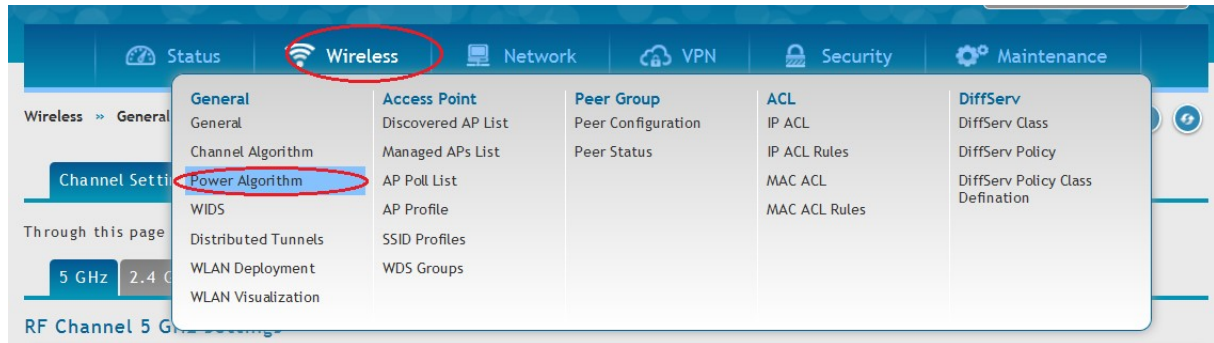
### RF Channel 2.4 GHz Settings

Radio	2.4 GHz (802.11 b/g/n)	
Channel Plan Mode	<input type="radio"/> Manual <input type="radio"/> Interval <input checked="" type="radio"/> Fixed Time	
Channel Plan Fixed Time	<input type="text" value="4:0"/>	[Range: 00:00 - 23:59] Hours and Seconds
Ignore Unmanaged Aps	<input type="checkbox"/> OFF	
Channel Change Threshold	<input type="text" value="-82"/>	[Default: -82, Range: -99 to -1]
Managed AP CH Conflict Threshold	<input type="text" value="-56"/>	[Default: -56, Range: -99 to -1]

Channel Plan  
Channel Plan Mode

= select 5 GHz and later on 2.4 GHz radio  
= we recommend to use a fixed time (f.e. 2:00 am) as a channel plan, also please use different times for the plan for each radio

Wireless > Power Algorithm



Power Adjustment Mode = Auto

**Please be advised that this settings and values are only suggestions which we generally recommend. The exact and detailed values and settings in your unique setup should be defined specifically for your environment and clients.**