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

[requirements]

1. Unified Wireless Controller/Switch with latest firmware fersion: 4.4.1.x and newer
(this settings are also valid for DWS-4026 (FW 4.3.x and newer) & DWS-3160 (FW 4.3.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-2000/driver_software/
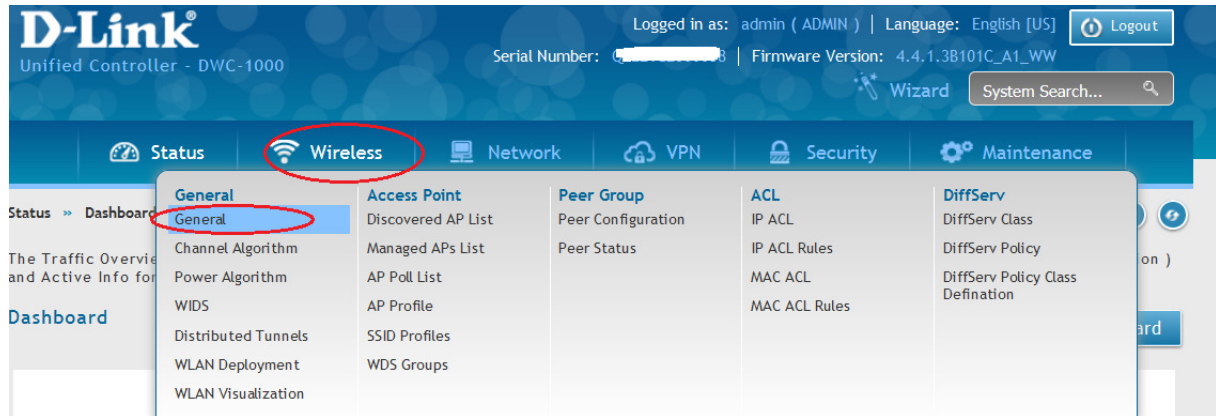ftp://ftp.dlink.de/dws/dws-3160-24pc/driver_software/
ftp://ftp.dlink.de/dws/dws-3160-24tc/driver_software/
ftp://ftp.dlink.de/dws/dws-4026/driver_software/

[setup]

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

1.)

Navigate to the Submenu > wireless > general

Modifie the values according to your setup:

Peer Adress Group	= defines the peer group in which you can peer several DWC's
Client Roam Timeout	= 1
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

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WLAN Global Setup

WLAN Controller Operational Status   ON

IP Address   192.168.10.1

Peer Group ID   `1`   [Default: 1, Range: 1 - 255]

Client Roam Timeout   `1`   [Range: 1 - 120] Seconds

Ad Hoc Client Status Timeout   `1`   [Range: 0 - 168] Hours

AP Failure Status Timeout   `1`   [Range: 0 - 168] Hours

Client MAC Authentication Mode   ● White-list   ○ Black-list

RF Scan Status Timeout   `1`   [Range: 0 - 168] Hours

Detected Clients Status Timeout   `1`   [Range: 0 - 168] Hours

Tunnel IP MTU Size   ● 1500   ○ 1520

Cluster Priority   `1`   [Range: 0 - 255]

AP Client QoS   OFF

Radius Authentication Server   Default-RADIUS-Server

Radius Authentication Server Status   Configured

Radius Accounting Server   Default-RADIUS-Server

Radius Accounting Server Status   Configured

Global Accounting Mode   OFF

AP Validation

AP MAC Validation   ● Local   ○ Radius

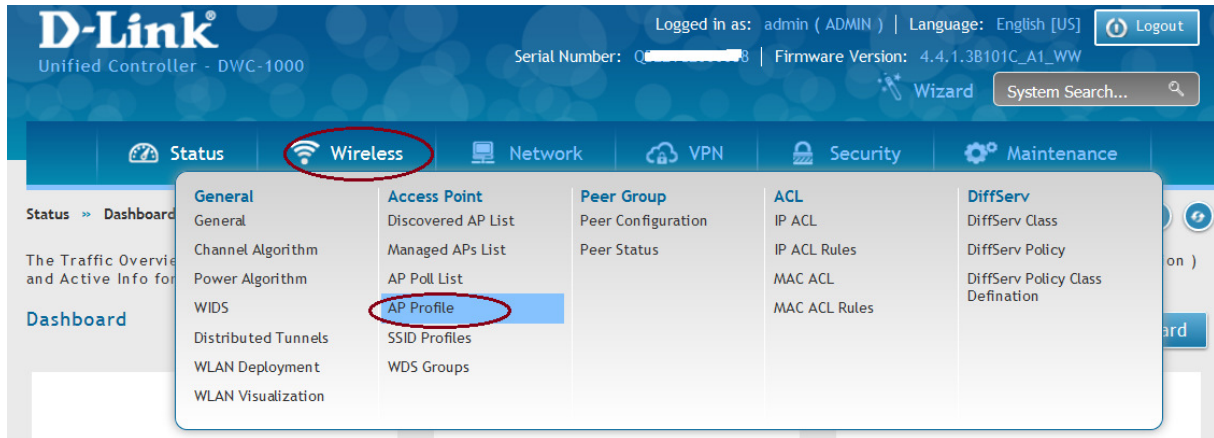Require Authentication Passphrase   OFF

Manage AP with Previous Release Code   OFF

Country Configuration

Country Code   DE - Germany

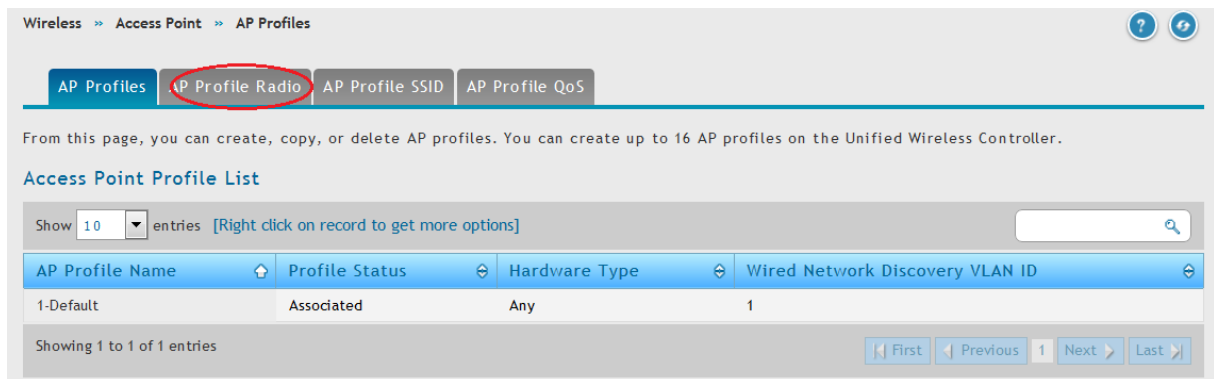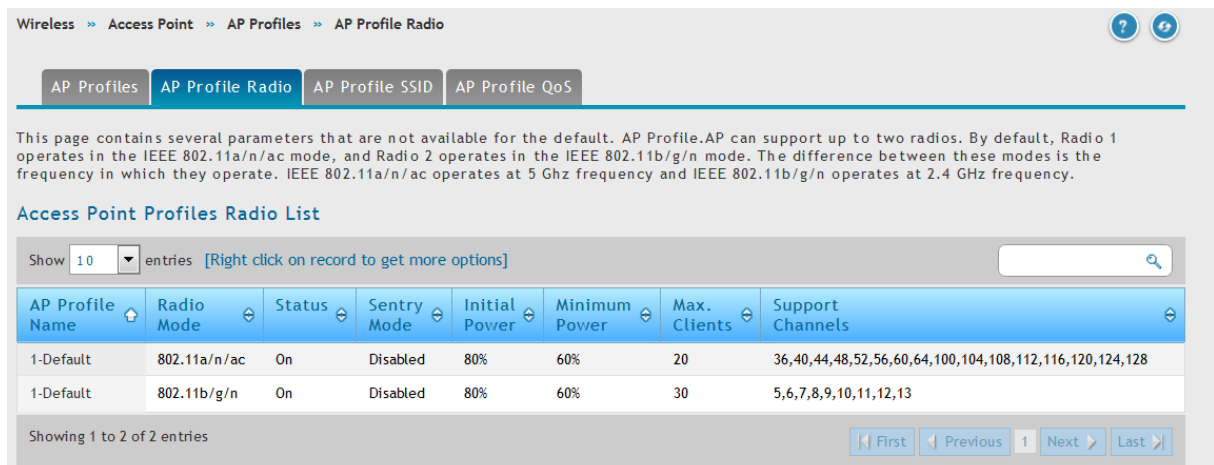Save   Cancel

2.)

Navigate to the Submenu > Wireless > AP Profile

Open the Menue > 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

5 GHz Band/Radio

AP Profile Radio Configuration ⓧ

AP Profile	1-Default
Radio Mode	1-802.11a/n/ac

Radio Configuration

State	ON
Radio Scheduler	Scheduler Off
RTS Threshold	1500 [Range: 0 - 2347] Bytes
Load Balancing	OFF
Maximum Clients	20 [Range: 0 - 200]
RF Scan Other Channels	OFF
RF Scan Sentry	OFF
Mode	○ IEEE 802.11a ○ IEEE 802.11a/n ○ 5GHz IEEE 802.11n
	● IEEE 802.11 a/n/ac ○ IEEE 802.11n/ac

Save

AP Profile Radio Configuration ⓧ

Mode	○ IEEE 802.11a ○ IEEE 802.11a/n ○ 5GHz IEEE 802.11n
	● IEEE 802.11 a/n/ac ○ IEEE 802.11n/ac
DTIM Period	10 [Range: 1 - 255] Beacons
Beacon Interval	75 [Range: 20 - 2000] M. Sec.
Automatic Channel	ON
Automatic Power	ON
Initial Power	80 [Range: 1% - 100%]
Minimum Power	60 [Range: 1% - 100%]
APSD Mode	ON
Frag Threshold	1500 [Range: 256 - 2346] Bytes
Short Retries	7

Save

AP Profile Radio Configuration ⓧ

Frag Threshold	1500 [Range: 256 - 2346] Bytes
Short Retries	7
Long Retries	4
Rate Limiting	ON
Transmit Lifetime	512
Rate Limit	30 [Range: 1 - 50] Pkts/Sec
Receive Lifetime	512
Rate Limit Burst	40 [Range: 1 - 75] Pkts/Sec
Station Isolation	OFF
Channel Bandwidth	○ 20 MHz ○ 40 MHz ● 80 MHz
Primary Channel	● Lower
Protection	● Auto ○ Off

Save

AP Profile Radio Configuration ⓧ

Protection	● Auto ○ Off
Short Guard Interval	ON
Space Time Block Code	ON
Radio Resource Management	OFF
No ACK	OFF
Force Roaming	OFF
Multicast Tx Rate (Mbps)	Auto

Channels

Auto Eligible Channels	36 / 40 / 44 / 48
Basic Rate Set (Mbps)	6 / 9

Save

RTS Threshold   = 1500
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]

APSD Mode   = Enable
Frag Threshold   = 1500
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 MHz
[defines the useable channel bandwith, wider channel will provide higher troughput, but lesser channel to select, 80MHz channel is mandatory for IEEE802.11ac]

Space Time Block Code (STBC) = ON
*[disabling this option will result in a slightly higher data troughput, 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 /   = The Basic Rate set is the rate that all clients that want to
Supported Rate Set   associate with a AP must support. For backward compatibility with 802.11a clients, the Basic Rate set is generally 6, 12 and 24Mbps. 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.

2,4 GHz Band/Radio

AP Profile Radio Configuration   X

AP Profile	1-Default
Radio Mode	2-802.11b/g/n

Radio Configuration

State	ON
Radio Scheduler	Scheduler Off
RTS Threshold	1500 [Range: 0 - 2347] Bytes
Load Balancing	OFF
Maximum Clients	30 [Range: 0 - 200]
RF Scan Other Channels	ON
RF Scan Sentry	OFF
RF Scan Interval	60 [Range: 30 - 120] Seconds
RF Scan Duration	10 [Range: 10 - 2000] M. Sec.

Save

AP Profile Radio Configuration   X

Mode	○ IEEE 802.11b/g ◉ IEEE 802.11b/g/n ○ 2.4GHz IEEE 802.11n
DTIM Period	10 [Range: 1 - 255] Beacons
Beacon Interval	75 [Range: 20 - 2000] M. Sec.
Automatic Channel	ON
Automatic Power	ON
Initial Power	80 [Range: 1% - 100%]
Minimum Power	60 [Range: 1% - 100%]
APSD Mode	ON
Frag Threshold	1500 [Range: 256 - 2346] Bytes
Short Retries	7
Long Retries	4

Save

AP Profile Radio Configuration   X

Rate Limiting	ON
Transmit Lifetime	512
Rate Limit	30 [Range: 1 - 50] Pkts/Sec
Receive Lifetime	512
Rate Limit Burst	40 [Range: 1 - 75] Pkts/Sec
Station Isolation	OFF
Channel Bandwidth	○ 20 MHz ◉ 40 MHz
Primary Channel	◉ Upper ○ Lower
Protection	◉ Auto ○ Off
Short Guard Interval	ON
Space Time Block Code	ON
Radio Resource	OFF

Save

RTS Threshold   = 1500
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]

APSD Mode   = Enable
Frag Threshold   = 1500
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 MHz
[defines the useable channel bandwith, wider channel will provide higher troughput, but lesser channel to select]

Space Time Block Code (STBC) = ON
[disabling this option will result in a slightly higher data troughput, 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.

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.

3.) optimization when using WPA2-AES encryption.

Navigate to the Submenu > Wireless Access Point > AP Profiles > AP Profiles SSIDs
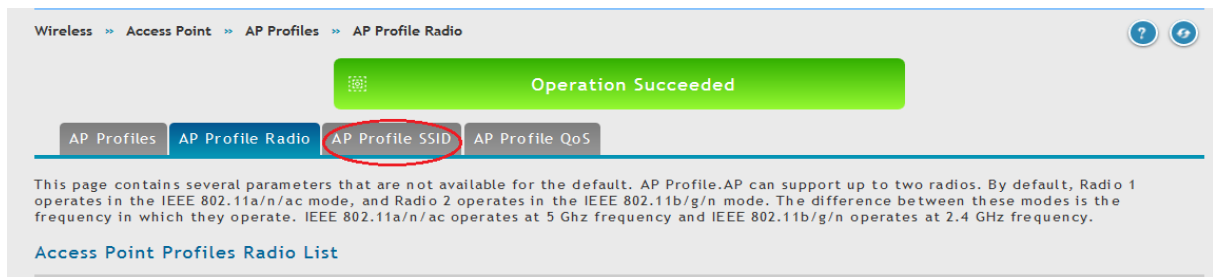
Choose the SSID you want to modify by clicking right mouse and selecting edit.

(the SSID settings are a global variable, no matter in which AP Profile the SSID is being transmitted)
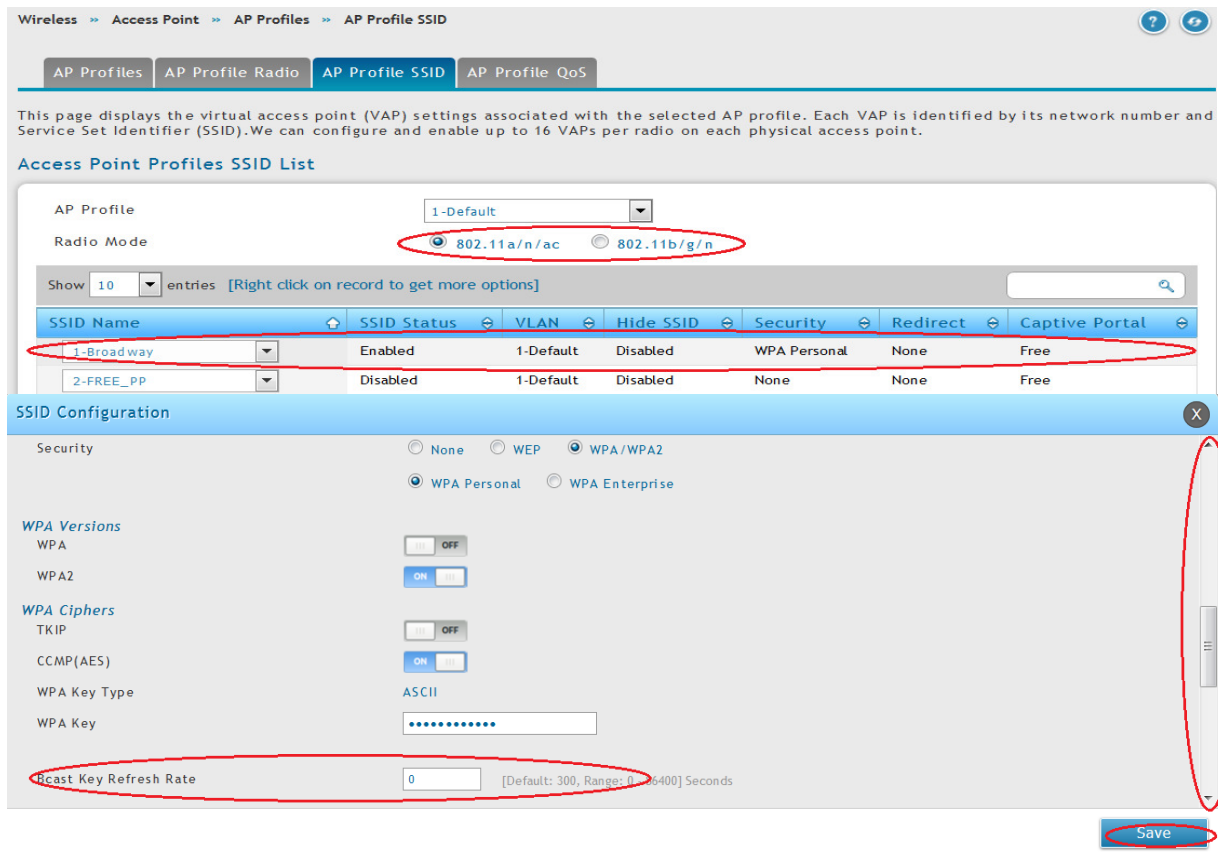
WPA2   = enable
WPA AES   = enable
Bcast Key Refresh Rate   = 0

Please only activate WPA2 & CCMP (AES) since this is compliant with current IEEE standard.

With the save button you save your settings.
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- 11 -

Navigate to the Submenu > Wireless Access Point > AP Profiles

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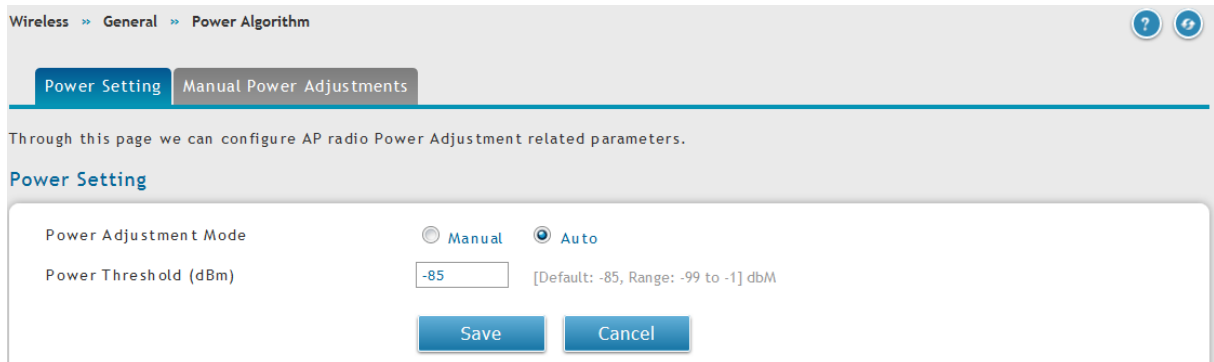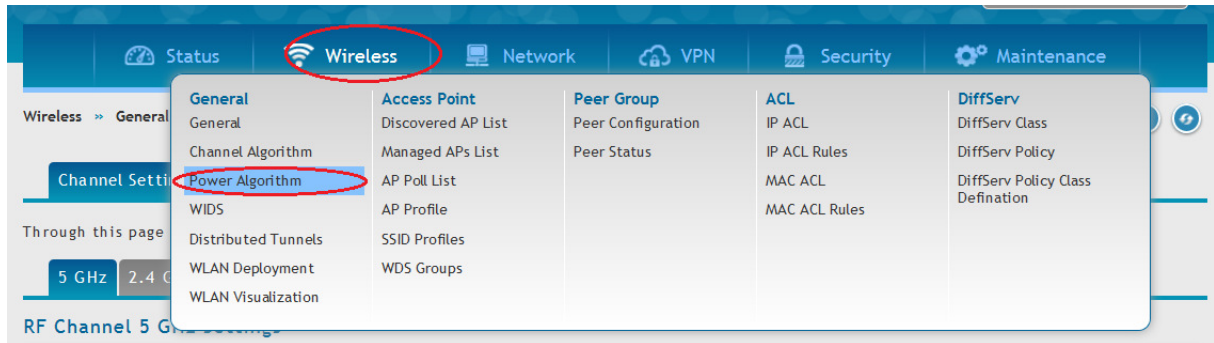
Wireless > Channel Algorithm
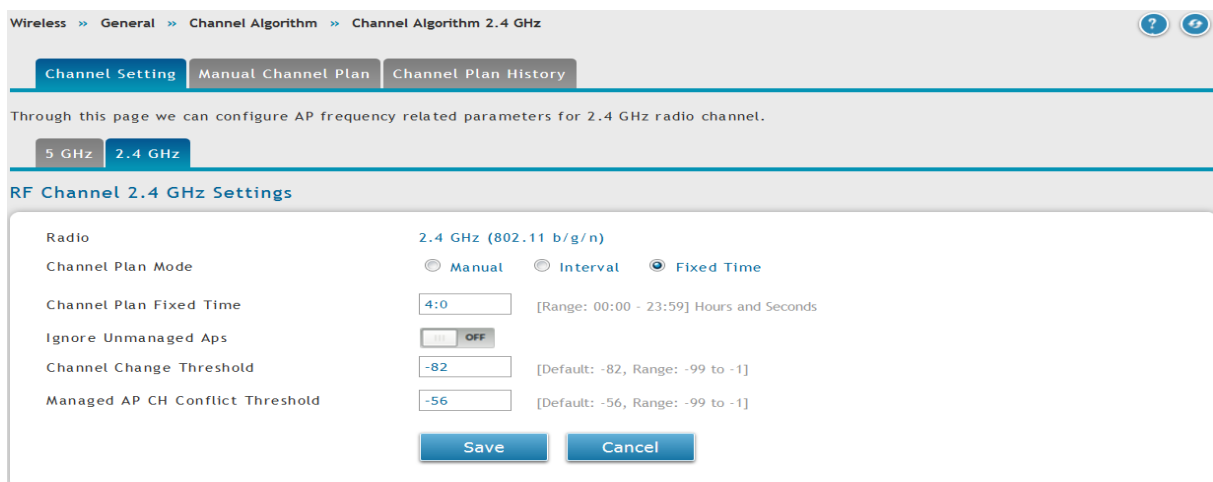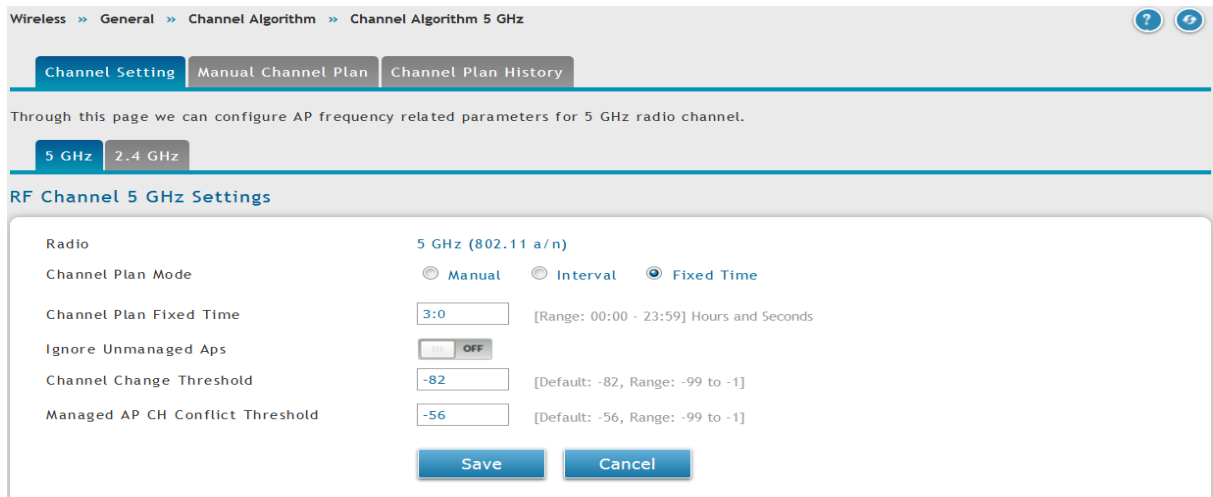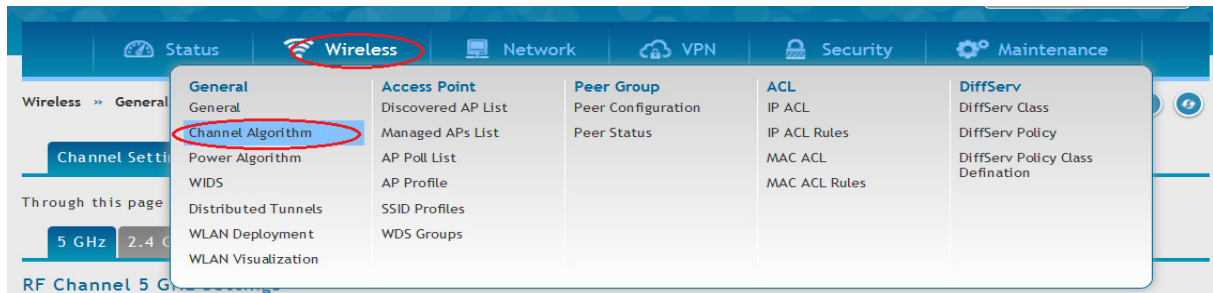
Channel Plan   = select 5 GHz and later on 2.4 GHz radio
Channel Plan Mode   = we recommend to use a fixed time (f.e. 2:00 am) as a
                              channel plan, also please use different times for the plan
                              for each radio

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.