

# HowTo: setup of WDS using DWC-x000 and f.e. DWL-6610AP (B-Rev/APE)

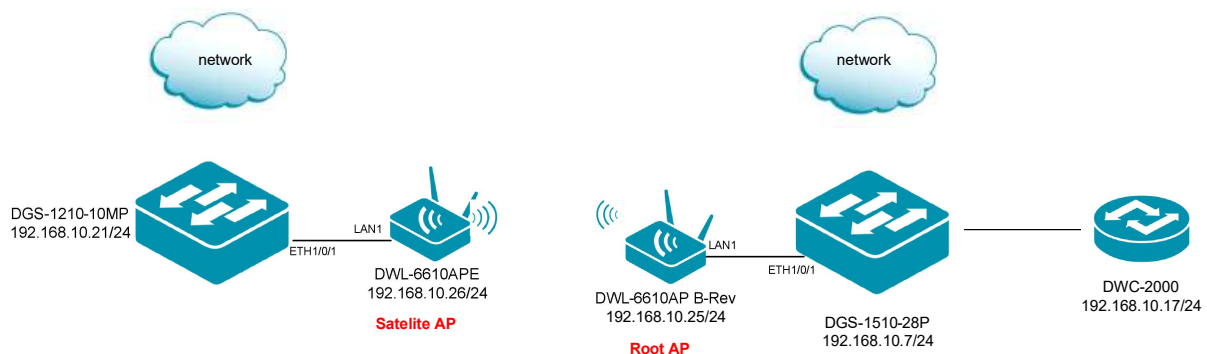
## [Requirements]

1. DWC-x000 with latest firmware 4.7.2.x
2. compatible AP with latest firmware

NOT all APs do support WDS in managed mode, therefore please check in advance if the AP you want to use support this feature.

## [Scenario]

2 managed APs should form a WDS bridge, so that a network behind the „satellite“-AP should be reachable.

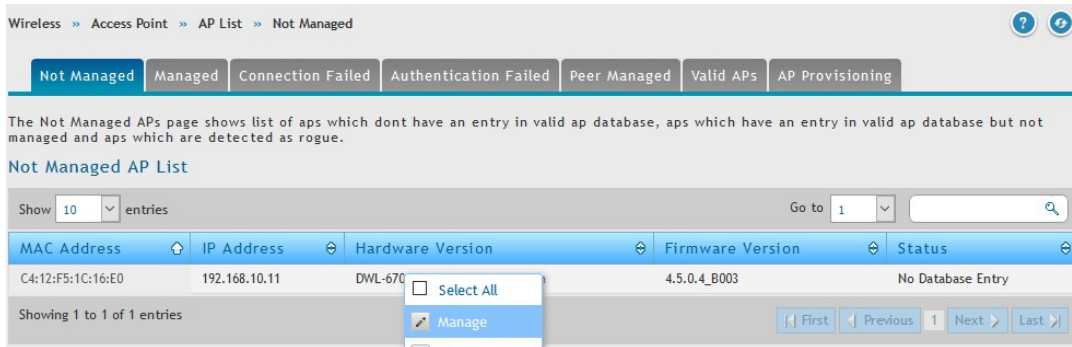


## [preparation]

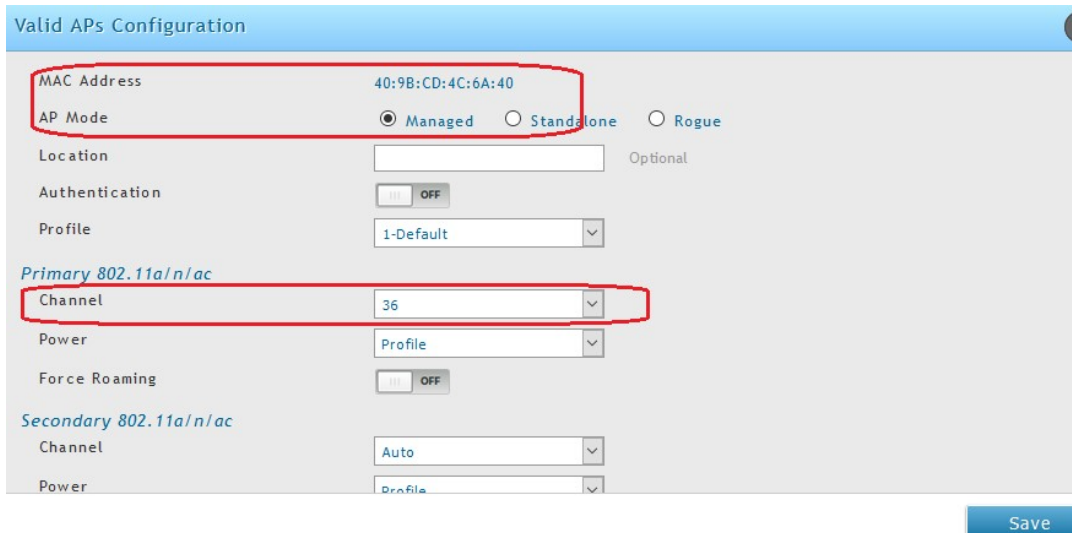
- ⇒ Pre-configure your DWC-x000 System including AP Profile
- ⇒ ensure that the WIFI Signal strength between both AP should be 65-70% at a minimum

### [manage both APs]

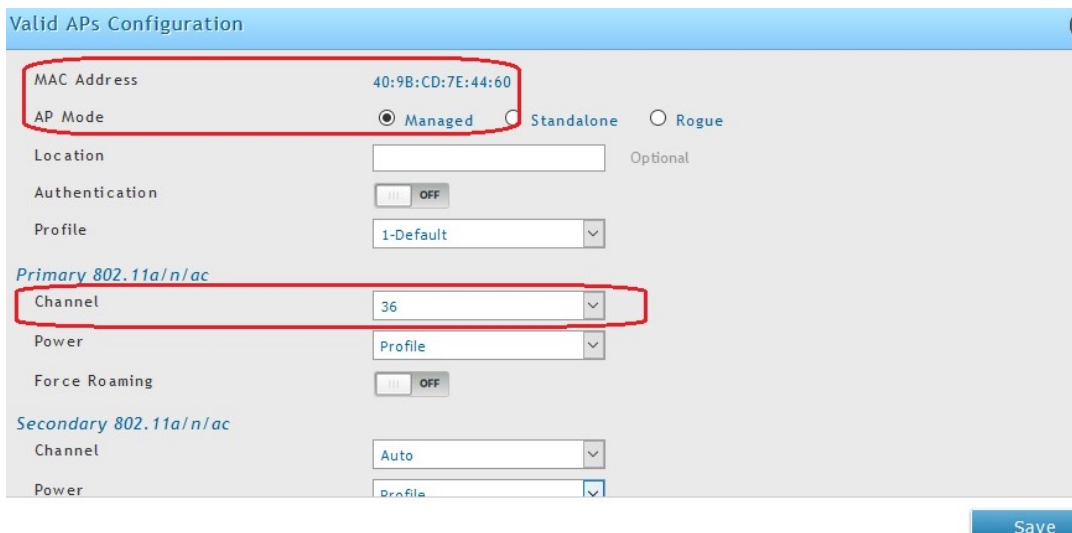
- 1.) connect both APs into the local network, so that they can be managed
- 2.) take both into Management



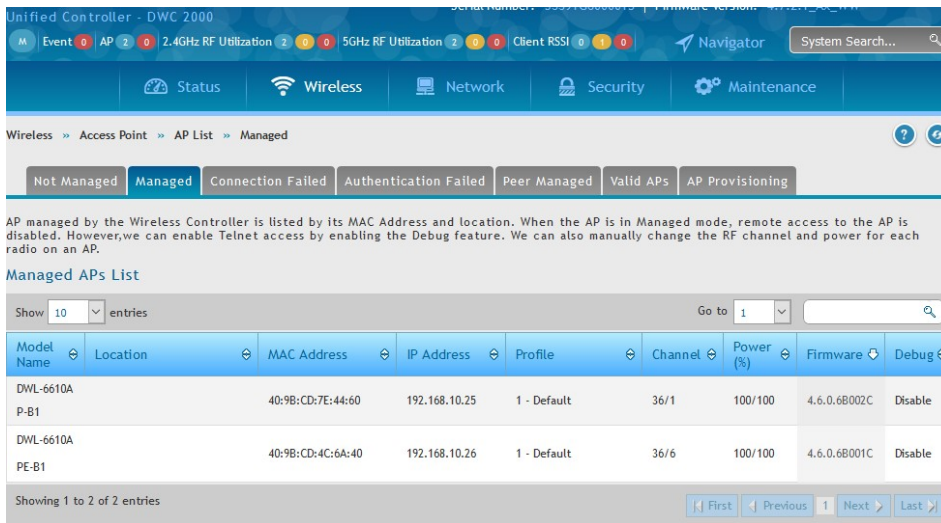
- 3.) also define the WLAN Channel for the Radio where you want to use WDS manually
  - a. in this Scenatio we use 5 GHz indoor Channel 36



- 4.) repeat this step for the 2<sup>nd</sup> AP

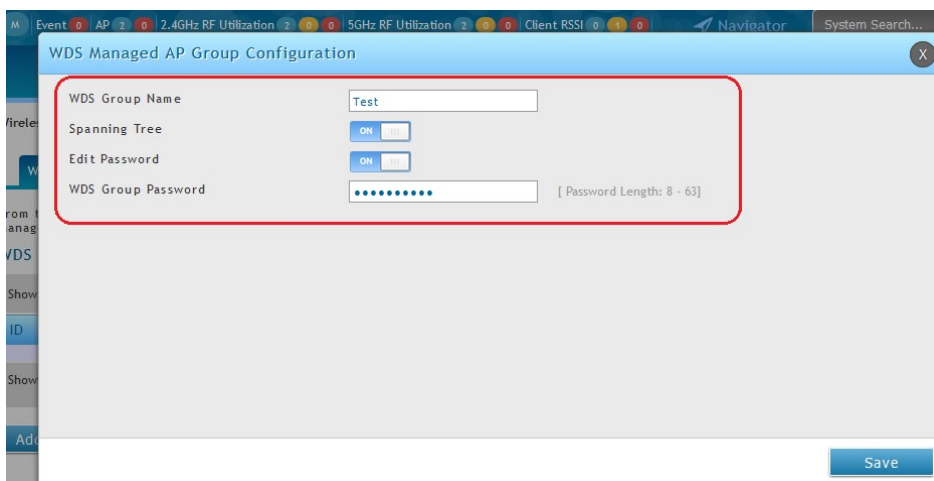
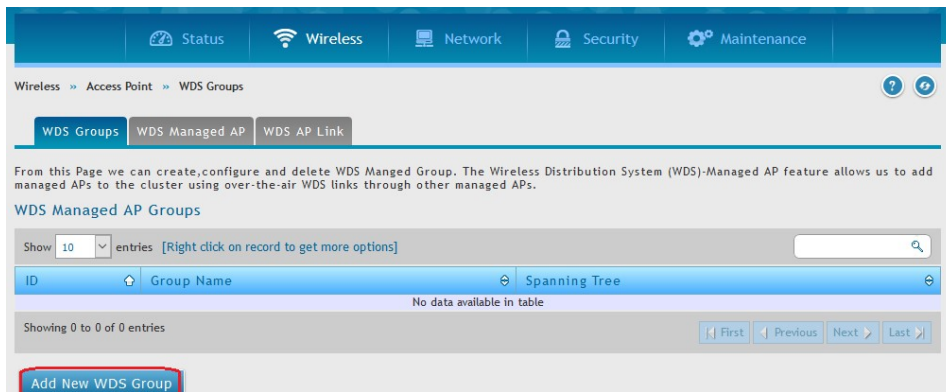


5.) check that both AP to be managed



[defining the WDS-Group]

6.) define the WDS-Group



- a. in this example we use following settings:
- i. WDS Group Name = Test
  - ii. Spanning Tree = Enabled
  - iii. WDS Group Password = 1234567890

**Operation Succeeded**

[WDS Groups](#) [WDS Managed AP](#) [WDS AP Link](#)

From this Page we can create,configure and delete WDS Manged Group. The Wireless Distribution System (WDS)-Managed AP feature allows us to add managed APs to the cluster using over-the-air WDS links through other managed APs.

### WDS Managed AP Groups

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

ID	Group Name	Spanning Tree
1	Test	Enabled

Showing 1 to 1 of 1 entries

[First](#) [Previous](#) [1](#) [Next](#) [Last](#)

### 7.) define the WDS-Managed APs for this Group

Wireless » Access Point » WDS Groups » WDS Managed AP

[WDS Groups](#) [WDS Managed AP](#) [WDS AP Link](#)

This Page allows you to view the APs that are members of the group, add new members, and change STP Priority values for existing members. After you create a WDS-Managed AP group, use the WDS Managed AP Configuration page to view the APs that are members of the group, add new members, and change STP Priority values for existing members.

### WDS Managed AP List

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

ID	AP MAC	AP Hardware Type	STP Priority
No data available in table			

Showing 0 to 0 of 0 entries

[First](#) [Previous](#) [Next](#) [Last](#)

[Add New WDS Managed AP](#)

WDS Managed AP Configuration

WDS Managed Group Id	1	▼
Valid AP MAC Address	40:9B:CD:7E:44:60	▼
Hardware Type String	DWL-6610AP-B1 Dual Radio a/b/g/n/ac	
WDS AP MAC Address	40:9B:CD:7E:44:60	
STP Priority	1	[Length: 0 - 64]

- a. in this example we use following settings:
- i. WDS Managed Group ID = 1 (the one we created right before)
  - ii. Valid AP MAC Address = the Base MAC (Management MAC of the AP)
  - iii. WDS AP MAC Address = this entrie defines which Radio/SSID will be used for WDS, in this example it is the 5 GHz SSID1 MAC

- b. repeat the same step for the 2<sup>nd</sup> AP

WDS Managed AP Configuration

WDS Managed Group Id	1	▼
Valid AP MAC Address	40:9B:CD:4C:6A:40	▼
Hardware Type String	40:9B:CD:4C:6A:40 a/b/g/n/ac	
WDS AP MAC Address	40:9B:CD:4C:6A:40	
STP Priority	1	[Length: 0 - 64]

## 8.) check the settings

Operation Succeeded

WDS Groups | **WDS Managed AP** | WDS AP Link

This Page allows you to view the APs that are members of the group, add new members, and change STP Priority values for existing members. After you create a WDS-Managed AP group, use the WDS Managed AP Configuration page to view the APs that are members of the group, add new members, and change STP Priority values for existing members.

**WDS Managed AP List**

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

ID	AP MAC	AP Hardware Type	STP Priority
1	40:9B:CD:4C:6A:40	DWL-6610AP-B1 Dual Radio a/b/g/n/ac	1
1	40:9B:CD:7E:44:60	DWL-6610AP-B1 Dual Radio a/b/g/n/ac	1

Showing 1 to 2 of 2 entries

## 9.) Create the WDS AP Link

Wireless » Access Point » WDS Groups » **WDS AP Link**

WDS Groups | WDS Managed AP | **WDS AP Link**

This Page allows you to configure the WDS links between the APs that are members of the group. After you create a WDS-Managed AP group, use the WDS AP Link Configuration page to configure the WDS links between the APs that are members of the group.

**WDS AP Link List**

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

Source AP MAC	Source AP Radio	Source AP Hardware Type	Destination AP MAC	Destination AP Radio	Destination AP Hardware Type	STP Link Cost
No data available in table						

Showing 0 to 0 of 0 entries

WDS AP Link Configuration

WDS Managed Group Id: 1

Source AP MAC Address: 40:9B:CD:7E:44:60

Source AP Radio: Primary 802.11a/n/ac

Destination AP MAC Address: 40:9B:CD:4C:6A:40

Destination AP Radio: Primary 802.11a/n/ac

Link Cost: 1 [Range: 0 - 255]

Save

- a. in this example we use following settings:
- i. Source AP MAC Address = the MAC Address of the **ROOT AP**
  - ii. Destination AP MAC Address = the MAC Address of the **SATELITE AP**

10.) check the settings

Wireless » Access Point » WDS Groups » WDS AP Link

WDS Groups | WDS Managed AP | **WDS AP Link**

This Page allows you to configure the WDS links between the APs that are members of the group. After you create a WDS-Managed AP group, use the WDS AP Link Configuration page to configure the WDS links between the APs that are members of the group.

WDS AP Link List

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

	Source AP MAC	Source AP Radio	Source AP Hardware Type	Destination AP MAC	Destination AP Radio	Destination AP Hardware Type	STP Link Cost
1	40:9B:CD:7E:44:60	1	DWL-6610AP-B1 Dual Radio a/b/g/n/ac	40:9B:CD:4C:6A:40	1	DWL-6610AP-B1 Dual Radio a/b/g/n/ac	1

Showing 1 to 1 of 1 entries

First Previous 1 Next Last

**Now connect to ROOT AP by serial console OR telnet/SSH**

11.) enable Debug Mode on both APs (valid until you disable it, or reboot AP)

Wireless » Access Point » AP List » Managed

Not Managed | **Managed** | Connection Failed | Authentication Failed | Peer Managed | Valid APs | AP Provisioning

AP managed by the Wireless Controller is listed by its MAC Address and location. When the AP is in Managed mode, remote access to the AP is disabled. However, we can enable Telnet access by enabling the Debug feature. We can also manually change the RF channel and power for each radio on an AP.

Managed APs List

Show 10 entries | Go to 1

Model Name	Location	MAC Address	IP Address	Profile	Channel	Power (%)	Firmware	Debug
DWL-6610A P-B1		40:9B:CD:		1 - Default	36/1	100/100	4.6.0.6B002C	Disable
DWL-6610A PE-B1		40:9B:CD:		1 - Default	36/6	100/100	4.6.0.6B001C	Disable

Showing 1 to 2 of 2 entries

First | Previous | 1 | Next | Last

Context Menu:

- Select All
- Details & Statistics
- Neighbor Information
- Reboot & Factory Default
- Channel & Power
- Firmware Upgrade
- Distributed Tunnel
- Disassociate Clients
- AP Debug**
- Network Setting

Managed AP Debug Configuration

MAC Address: 40:9B:CD:7E:44:60

Location:

IP Address: 192.168.10.25

Status: Not Started

Enable Debug: **ON**

Password: admin

Confirm Password: admin

Save

- a. in this example we use following settings:
- i. Enable Debug = ON
  - ii. Password = admin
  - iii. Confirm Password = admin

Repeat the same for the 2<sup>nd</sup> AP.



Wireless » Access Point » AP List » Managed

Not Managed | **Managed** | Connection Failed | Authentication Failed | Peer Managed | Valid APs | AP Provisioning

AP managed by the Wireless Controller is listed by its MAC Address and location. When the AP is in Managed mode, remote access to the AP is disabled. However, we can enable Telnet access by enabling the Debug feature. We can also manually change the RF channel and power for each radio on an AP.

### Managed APs List

Show 10 entries Go to 1

Model Name	Location	MAC Address	IP Address	Profile	Channel	Power (%)	Firmware	Debug
DWL-6610A P-B1		40:9B:CD:7E:44:60	192.168.10.25	1 - Default	36/1	100/100	4.6.0.6B002C	Enable
DWL-6610A PE-B1		40:9B:CD:4C:6A:40	192.168.10.26	1 - Default	36/6	100/100	4.6.0.6B001C	Enable

Showing 1 to 2 of 2 entries

First Previous 1 Next Last

Connect by Console or Telnet/SSH to the AP (in this example we use putty)

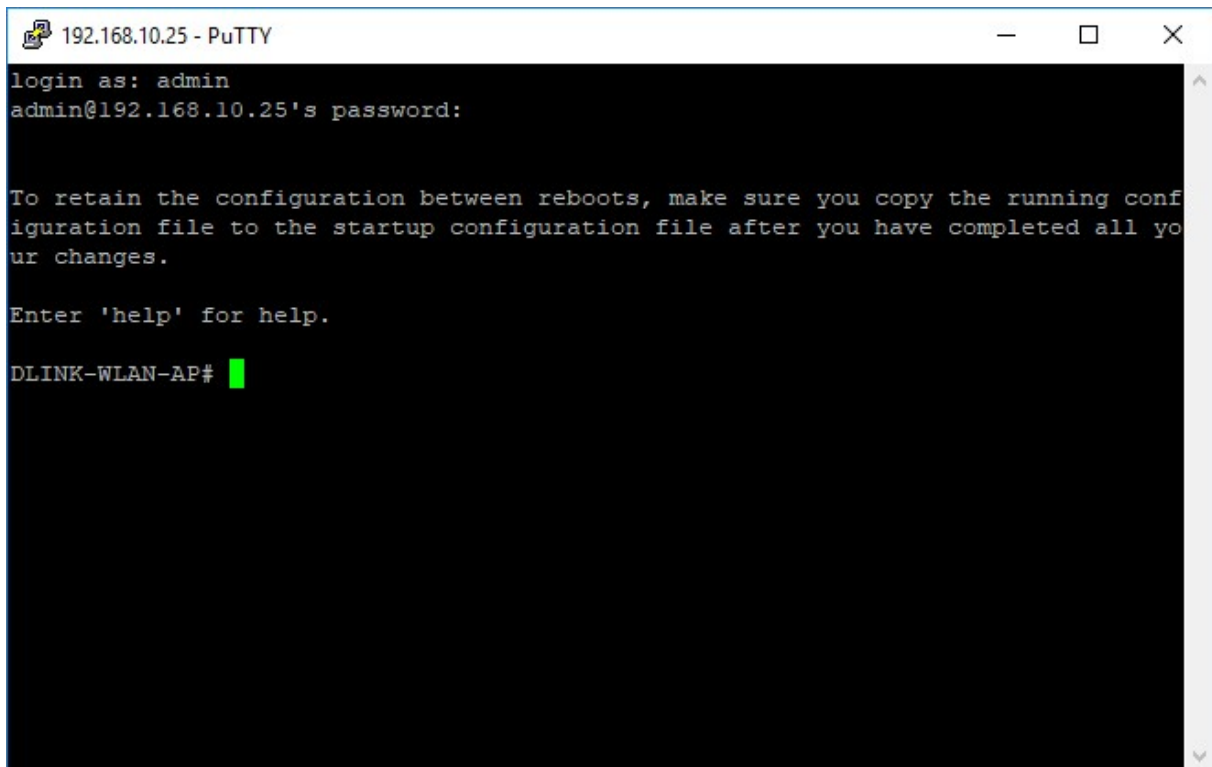
192.168.10.25 - PuTTY

**PuTTY Security Alert**

! The server's host key is not cached in the registry. You have no guarantee that the server is the computer you think it is.  
The server's rsa2 key fingerprint is:  
ssh-rsa 1040 8e:cb:5f:f6:87:dd:33:6e:bc:8a:d4:a5:b4:b2:00:1d  
If you trust this host, hit Yes to add the key to PuTTY's cache and carry on connecting.  
If you want to carry on connecting just once, without adding the key to the cache, hit No.  
If you do not trust this host, hit Cancel to abandon the connection.

Ja Nein Abbrechen

Login with the credentials “admin” & “admin” as we just before defined.



```
192.168.10.25 - PuTTY
login as: admin
admin@192.168.10.25's password:

To retain the configuration between reboots, make sure you copy the running configuration file to the startup configuration file after you have completed all your changes.

Enter 'help' for help.

DLINK-WLAN-AP#
```

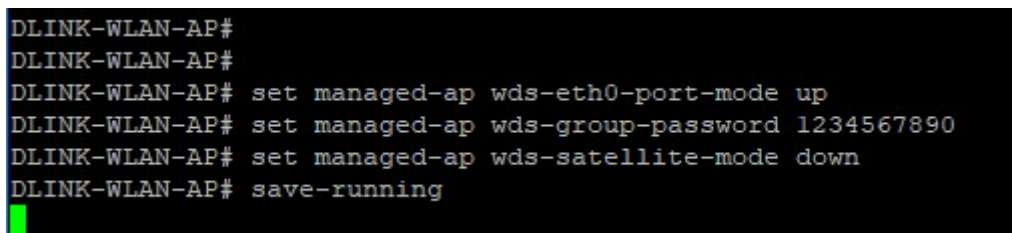
For the ROOT AP please run this 4 commands:

```
set managed-ap wds-eth0-port-mode up
```

```
set managed-ap wds-group-password 1234567890
```

```
set managed-ap wds-satellite-mode down
```

```
save-running
```



```
DLINK-WLAN-AP#
DLINK-WLAN-AP#
DLINK-WLAN-AP# set managed-ap wds-eth0-port-mode up
DLINK-WLAN-AP# set managed-ap wds-group-password 1234567890
DLINK-WLAN-AP# set managed-ap wds-satellite-mode down
DLINK-WLAN-AP# save-running
```

With "reboot" you reboot the AP. This also disabled the Debug-Mode on the AP.

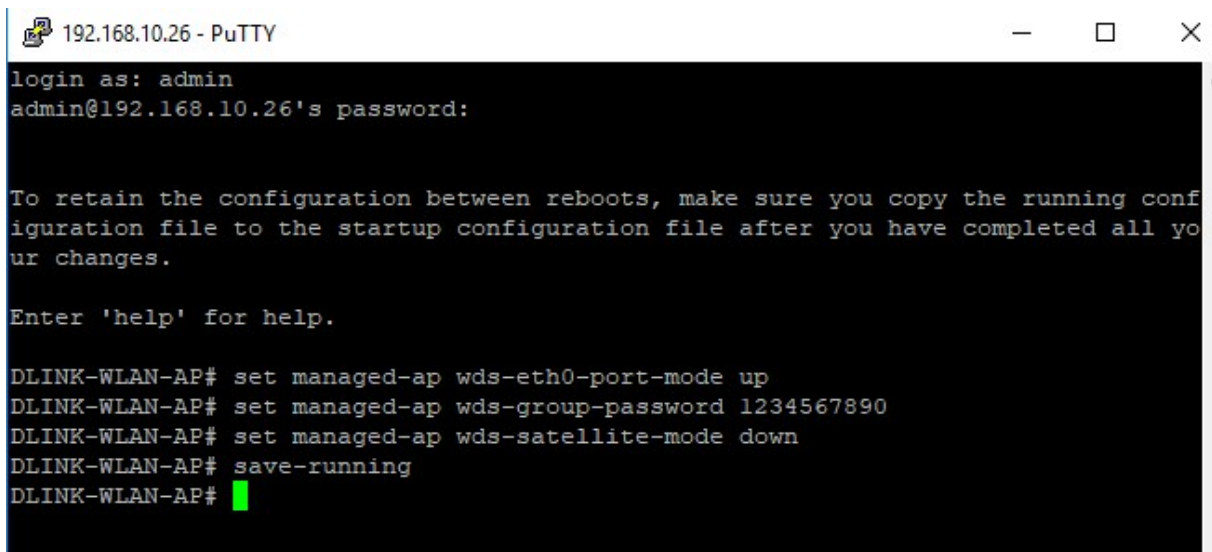
For the SATELITE AP please run this 4 commands:

```
set managed-ap wds-eth0-port-mode up
```

```
set managed-ap wds-group-password 1234567890
```

```
set managed-ap wds-satellite-mode up
```

```
save-running
```



```
192.168.10.26 - PuTTY
login as: admin
admin@192.168.10.26's password:

To retain the configuration between reboots, make sure you copy the running configuration file to the startup configuration file after you have completed all your changes.

Enter 'help' for help.

DLINK-WLAN-AP# set managed-ap wds-eth0-port-mode up
DLINK-WLAN-AP# set managed-ap wds-group-password 1234567890
DLINK-WLAN-AP# set managed-ap wds-satellite-mode down
DLINK-WLAN-AP# save-running
DLINK-WLAN-AP# █
```

Remove the Satellite AP now from your local network and place it in its remote location, so that the WDS can be established and no loop is being formed.

Check the DWC-x000 about the WDS connection:

Status » Wireless Information » WDS Groups Status

WDS Groups Status | WDS Group AP Status | WDS AP Status | WDS Link Status | WDS Link Statistics

This page displays summary information about configured WDS links.

### WDS Groups Status

Show 10 entries [This information is view only]

ID	Configured AP Count	Connected Root AP	Connected Satellite AP	Configured WDS Link Count	Detected WDS Links Count
1	2	1	1	1	1

Showing 1 to 1 of 1 entries

First Previous 1 Next Last

Status » Wireless Information » WDS Groups Status » WDS Group AP Status

WDS Groups Status | WDS Group AP Status | WDS AP Status | WDS Link Status | WDS Link Statistics

This page displays detailed information about the configured APs and links in the WDS Group.

### WDS AP Status

ID: 1

Configured AP Count: 2

Connected AP Count: 2

Source AP Count: 1

Destination AP Count: 1

Source Bridge AP MAC: 40:9B:CD:7E:44:60

Source Device Type: Root AP

Config WDS Link Count: 1

Detect WDS Link Count: 1

Blocked WDS Link Count: 0

WDS Group Password Change Status: Not Started

Edit Password:  OFF

Save Cancel

Status » Wireless Information » WDS Groups Status » WDS AP Status

WDS Groups Status | WDS Group AP Status | WDS AP Status | WDS Link Status | WDS Link Statistics

This page displays summary information about the APs in a configured WDS Group.

### WDS AP Status Summary

WDS Group ID: 1 - Test

Show 10 entries [This information is view only]

AP MAC Address	AP Connection Status	Satellite Mode	STP Root Mode	Root Path Cost	Ethernet Port STP State	Ethernet Port Mode	Ethernet Port Link State
40:9B:CD:4C:6A:40	Connected	Satellite	STP Root	0	Forwarding	Enabled	Up
40:9B:CD:7E:44:60	Connected	Wired	STP Root	0	Forwarding	Enabled	Up

Showing 1 to 2 of 2 entries

First Previous 1 Next Last

WDS Groups Status | WDS Group AP Status | WDS AP Status | **WDS Link Status** | WDS Link Statistics

This page displays summary information about the link configuration and link state in a WDS Group.

**WDS Link Statistics**

Show 10 entries [This information is view only]

ID	Source AP MAC	Source AP Radio	Destination AP MAC	Destination AP Radio	Source AP End-Point	Destination AP End-Point	Aggregation Mode	Source AP STP	Destination AP STP
1	40:9B:CD:7E:44:60	802.11a/n/ac	40:9B:CD:4C:6A:40	802.11a/n/ac	YES	YES	NO	Forwarding	Forwarding

Showing 1 to 1 of 1 entries

First Previous 1 Next Last

WDS Groups Status | WDS Group AP Status | WDS AP Status | WDS Link Status | **WDS Link Statistics**

This Page displays summary information about the packets sent and received on the WDS links.

**WDS Link Statistics**

Show 10 entries [This information is view only]

ID	Source AP MAC	Source Radio	Destination AP MAC	Destination Radio	Source AP Packets / Bytes Sent	Source AP Packets / Bytes Received	Destination AP Packets / Bytes Sent	Destination AP Packet / Bytes Received
1	40:9B:CD:7E:44:60	802.11a/n/ac	40:9B:CD:4C:6A:40	802.11a/n/ac	3783213/257926947	24051/2686686	3664675/250414272	31798/2414947

Showing 1 to 1 of 1 entries

First Previous 1 Next Last

If you change afterwards within your DWC-x000 the SSID (which you use for WDS) you might run the CLI commands on both units again!

40:9B:CD:7E:44:60	5,180 MHz	36	WDS-SSID1-24	-33 dBm	ac	RSNA-PSK	AES-COMP	Infrastructure	102.4 ms	7m
40:9B:CD:7E:44:70	2,437 MHz	6	WDS-SSID1-24	-34 dBm	n	RSNA-PSK	AES-COMP	Infrastructure	102.4 ms	7m
40:9B:CD:4C:6A:50	2,462 MHz	11	WDS-SSID1-24	-42 dBm	n	RSNA-PSK	AES-COMP	Infrastructure	102.4 ms	1m
40:9B:CD:4C:6A:40	5,180 MHz	36	WDS-SSID1-24	-43 dBm	ac	RSNA-PSK	AES-COMP	Infrastructure	102.4 ms	1m

The AP in this example now is configured in WDS Mode for 5 GHz and SSID Mode in 2.4 Ghz.