

Version 1.00

# Central WiFiManager Configuration Guide



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# Introduction

This document provides readers with a quick guide that explains the essential operation of the **Central WiFiManager (CWM)**. For a more detailed explanation about all the functions in the CWM, refer to the *Central WiFiManager User Manual*.

## System Requirements

	Large Scale Deployment	Small Scale Deployment
<b>Maximum APs Managed</b>	500 APs	100 APs
<b>Recommended CPU</b>	Microsoft® Intel i5 3.2GHz CPU	Microsoft® Intel i3 3.5GHz CPU
<b>Recommended RAM</b>	4G DDR3	2G DDR2
<b>Recommended Storage</b>	2TB	1TB
<b>Ethernet NIC</b>	Gigabit	Gigabit
<b>Display Card</b>	DirectX 11 1GB	DirectX 11 1GB
<b>Windows Platform</b>	Microsoft® Windows 2008 Server Microsoft® Windows 2012 Server	Microsoft® Windows 7 Professional Microsoft® Windows 2008 Server Microsoft® Windows 2012 Server

## Access Point Requirement

The following access points are compatible to be managed by the CWM:

- DAP-2310 (H/W: B1, F/W: v2.01rc013 or above)
- DAP-2360 (H/W: B1, F/W: v2.01rc012 or above)
- DAP-2330 (H/W: A1, F/W: v1.01rc014 or above)
- DAP-2660 (H/W: A1, F/W: v1.05rc016 or above)
- DAP-2690 (H/W: B1, F/W: v3.10rc072 or above)
- DAP-2695 (H/W: A1, F/W: v1.10rc035 or above)

## Latest CWM Modules

The following modules are available and can be installed additionally as add-ons to the CWM:

- CWM\_DAP2310B v2.01-R12
- CWM\_DAP2330 v1.01-R12
- CWM\_DAP2360B v2.01-R09
- CWM\_DAP2660 v1.05-R20
- CWM\_DAP-2690 v3.10-R25
- CWM\_DAP2695 v1.10-R29

# Scenario 1 - Basic Setup

In this scenario we'll configure a very basic Layer 2 edge network configuration with one PC running the Central WiFiManager (CWM) server and two DAP-2660 access points. The objectives in this scenario are as follow:

- To understand the minimum configuration for operation.
- To add access points for CWM management.
- To understand the essential CWM features.

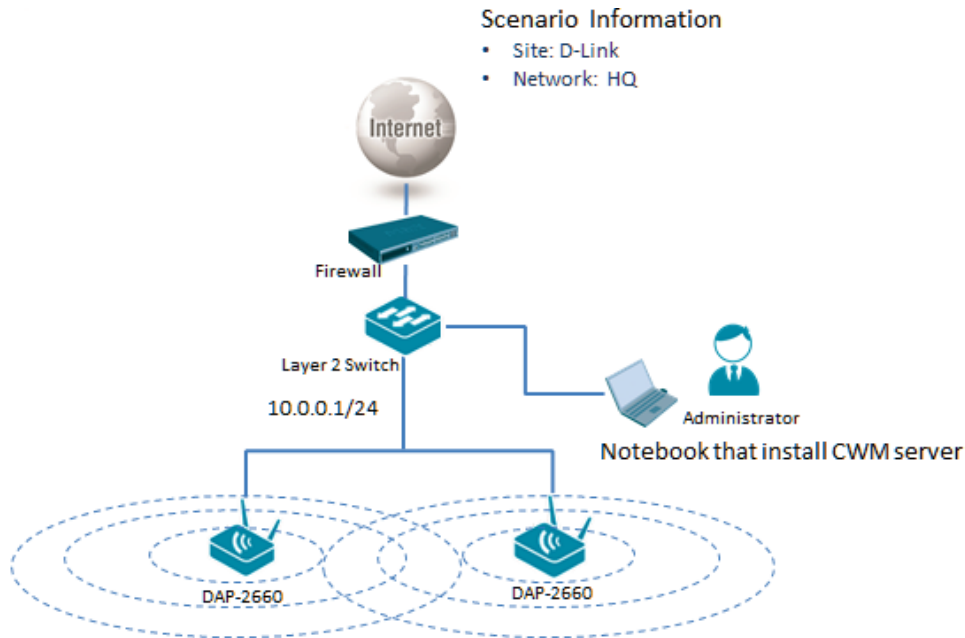


Figure 1-1 Basic Setup Network Layout

The overview of the configuration steps for Central WiFiManager is as follows:

1. [Install Central WiFiManager on Computer](#)
2. [Install Access Point Module](#)
3. [Run the Central WifiManager Server](#)
4. [Login to the Central WiFiManager](#)
5. [Check and Download AP Module Online](#)
6. [Create Site and Network, Configure SSID Settings](#)
7. [Add Access Points in CWM using the Installation Tool](#)

## 1.1. Install Central WiFiManager on Computer

After running the Central WiFiManager installation file (*Central WiFiManager v.100.exe*), a welcome window will be displayed.

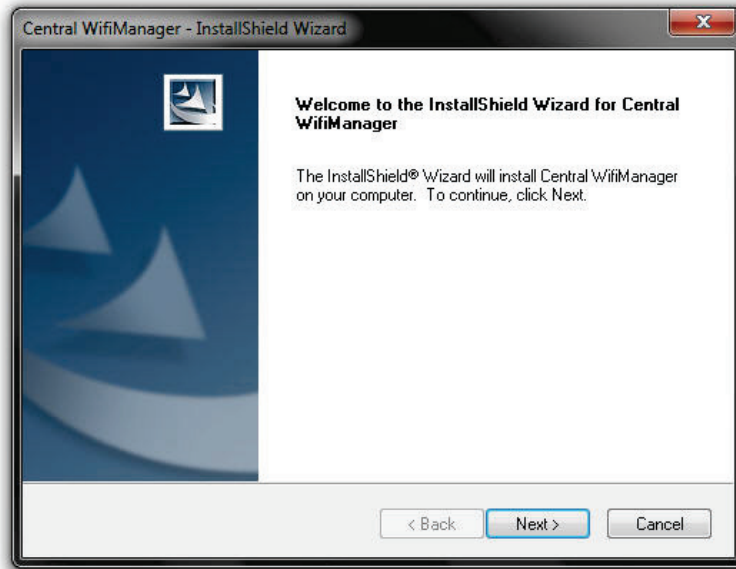


Figure 1-2 Install Central WiFiManager (Welcome)

Click the **Next >** button to continue to the next step. Click the **Cancel** button to stop and exit the installation.

In this window, the destination location is displayed, where the software will be installed. If this application needs to be installed at a different location or on a different drive, click the **Browse** button and navigate to the new destination location.

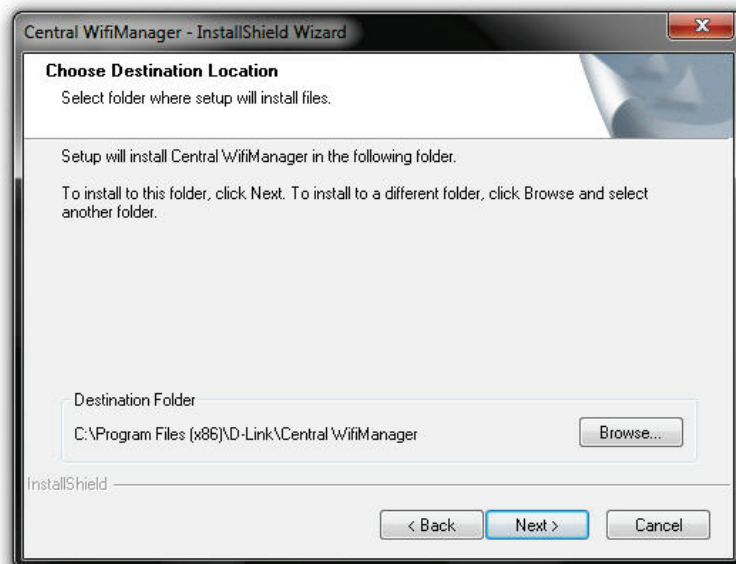


Figure 1-3 Install Central WiFiManager (Destination Location)

Click the **< Back** button to return to the previous step. Click the **Next >** button to continue to the next step. Click the **Cancel** button to stop and exit the installation.

In this window, we need to enter the IP address for the Central WiFiManager in the **Central WiFiManager Server** space provided. This is normally the IP address of the PC being used for the installation. This IP address can be modified later.

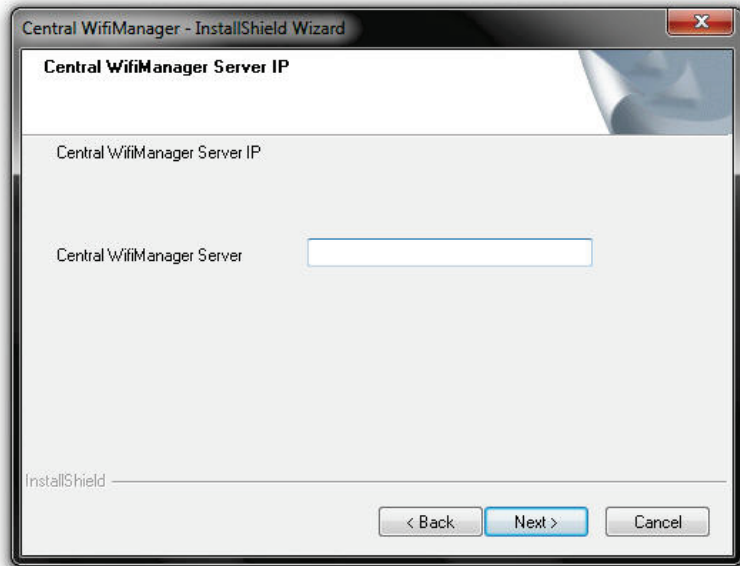


Figure 1-4 Install Central WiFiManager (Server IP)

Click the **< Back** button to return to the previous step. Click the **Next >** button to continue to the next step. Click the **Cancel** button to stop and exit the installation.

In this window we can change the **Manager Port**, **Listen Port** and **Service Port** numbers. These ports numbers are used for multiple access point connections and it can only be specified here and can't be modified after the installation. Leave these port numbers on the default settings if these ports have not been used on this computer.

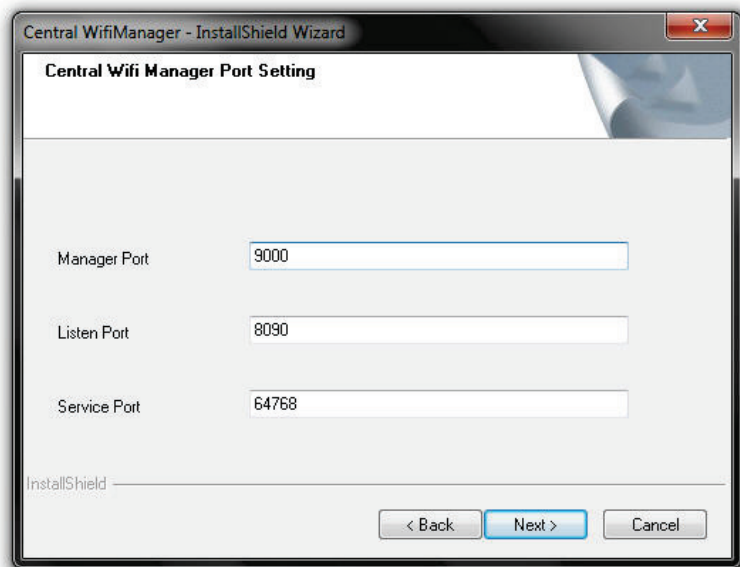


Figure 1-5 Install Central WiFiManager (Port Settings)

Click the **< Back** button to return to the previous step. Click the **Next >** button to continue to the next step. Click the **Cancel** button to stop and exit the installation.

In this window, we must enter the **PostgreSQL** database password that will be associated with this application in the spaces provided. Enter the same password in the **Password** and **Retype password** spaces provided. This password cannot be modified after this installation.

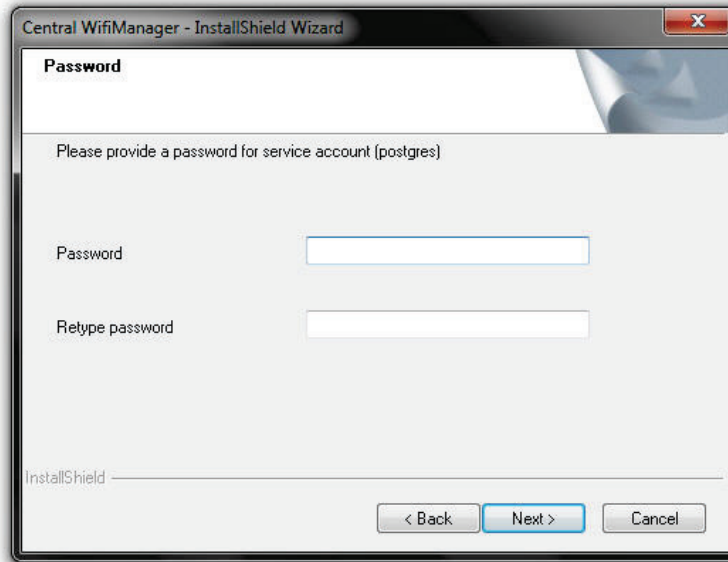


Figure 1-6 Install Central WifiManager (Password)

Click the **< Back** button to return to the previous step. Click the **Next >** button to continue to the next step. Click the **Cancel** button to stop and exit the installation.

The installation of this application requires **Microsoft Visual C++ 2008 Redistributable** to be installed on this computer. If not found, the option will be given to install the required redistributable. If found this step will be skipped.

The Apache HTTP Server application might be blocked by the computer's firewall. If Windows' default firewall is used, a security alert message will be displayed. Click the **Allow Access** button to allow this application to communicate with the network. In this window, the user is reminded that apart from the Central WifiManager installation, each access point that will be used in this application requires a separate module to be installed. This will be discussed in the next section.

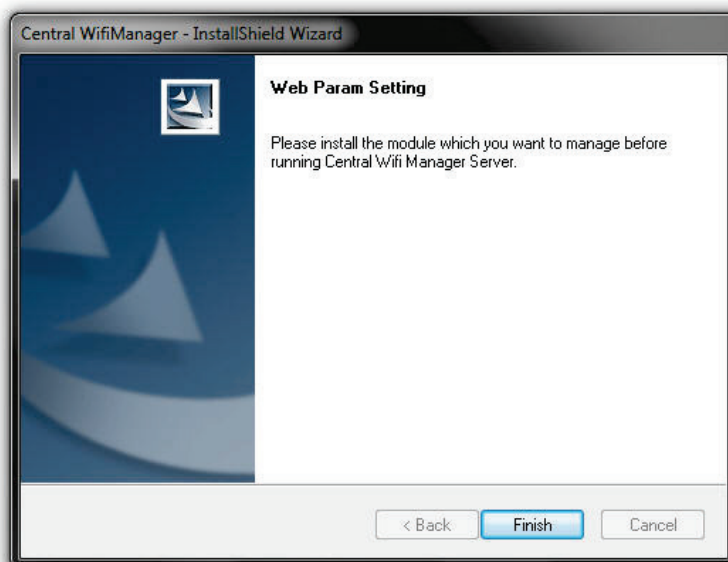


Figure 1-7 Install Central WifiManager (Finish)

Click the **Finish** button to complete and exit the installation wizard.

After the CWM installation, there will be two applications installed on the PC called the **Central WiFiManager Server** and the **Central WiFiManager**.

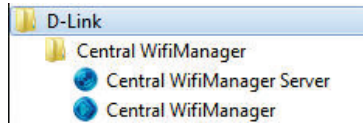


Figure 1-8 Central WiFiManager Files

## 1.2. Install Access Point Module

For each access point that will be used in the D-Link Central WiFiManager, we need to install an additional manager module. In this section we'll discuss the installation of the DAP-2660AP access point's manager module that will be used in the D-Link Central WiFiManager. If the Central WiFiManager Server is already running, it must be stopped and closed before that Access Point manager module can be installed.

After running the access point's manager module, a welcome message will be displayed to inform the user that the manager module will now be installed on the computer.

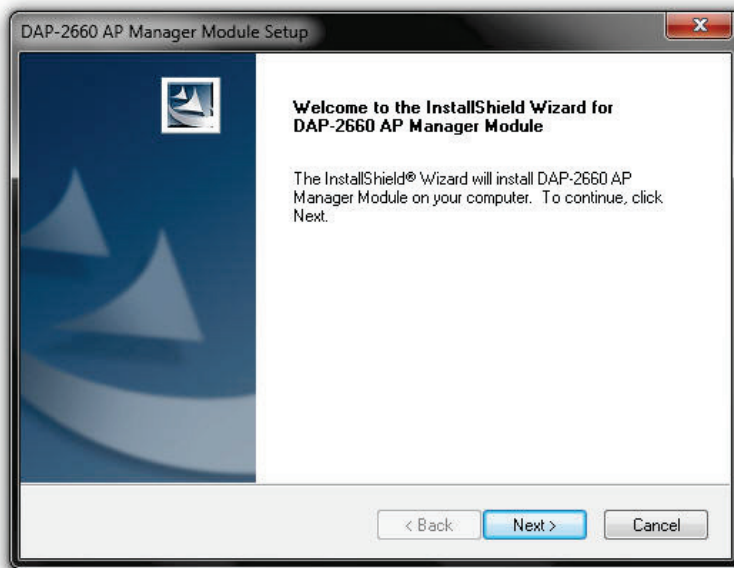


Figure 1-9 Install Access Point Module (Welcome)

Click the **Next >** button to continue to the next step. Click the **Cancel** button to stop and exit the installation.

After the access point's manager module was installed successfully, this window will appear.

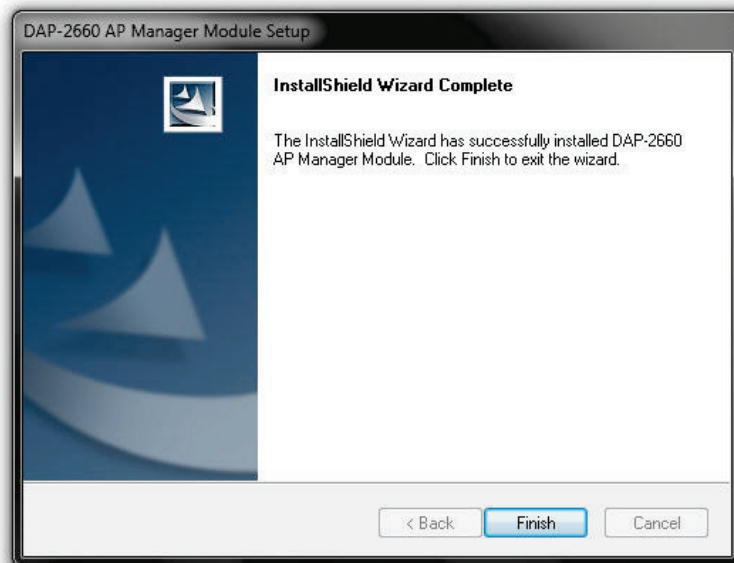


Figure 1-10 Install Access Point Module (Finish)



Click the **Finish** button to complete and exit the installation wizard.


### 1.3. Run the Central WifiManager Server

In this section, we'll discuss the Central WifiManager Server application. After the installation was completed the following applications will be available.

Click the  **Central WifiManager Server** option to open the server application.

After running the **Central WifiManager Server** application, the window (on the right) will appear. This is the management console window for the server application.

In the **Menu** bar, there are two options available, **Server** and **Help**. Under the **Server** menu we can **Start**, **Stop** or **Exit** the application. Alternatively, right under the **Server** menu option, there is also start and stop icons. Under the **Help** menu option, there is an **About** option that will, after being clicked, display the name, version and copyright details of this application.

In the **Settings** section, we can select to **Automatically open configuration window when Windows start up** and **Automatically start server when configuration window is open**. Select these options if needed. Click the  icon to start the server.

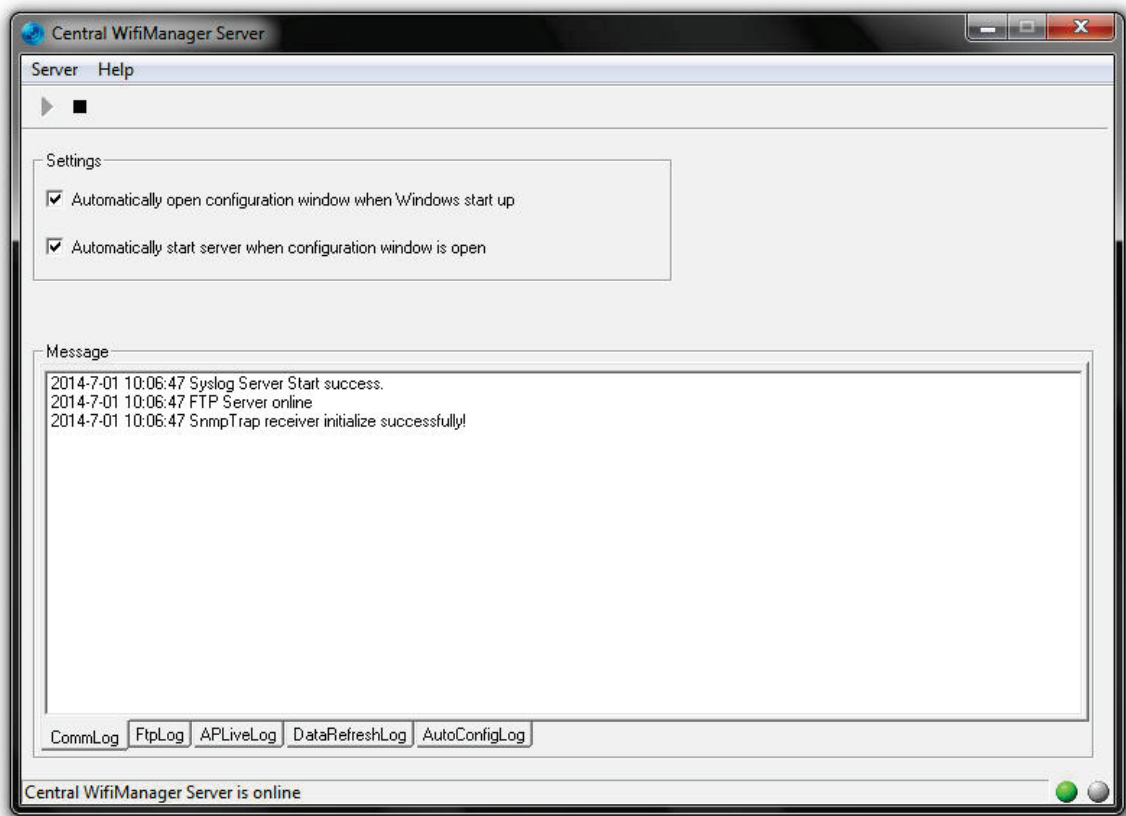






Figure 1-11 CWM Management Console


When clicking the close icon () on the far upper right corner, this application will close and exit. The server will not be running in the background. Click the minimize icon () to close this window and allow the server application to run in the background.

When the server is up and running, the left circle icon () at the far bottom right corner, will display green. When the server is not running the right circle icon () at the far bottom right corner, will display red.

To view log entries about the System, FTP Connectivity, Live Access Points, Data Transmissions and Automatic Configurations, tabs at the bottom of the **Message** section can be selected.

## 1.4. Login to the Central WiFiManager

### 1.4.1. Login to the CWM from a local computer

Click the  **Central WiFiManager** option to open the client application. After the Web browser was open and connection to the server was made successfully, a login window will appear. Enter the login user name and password and click **Login** to enter the Central WiFiManager configuration.

By default, the user name and password is **admin**.



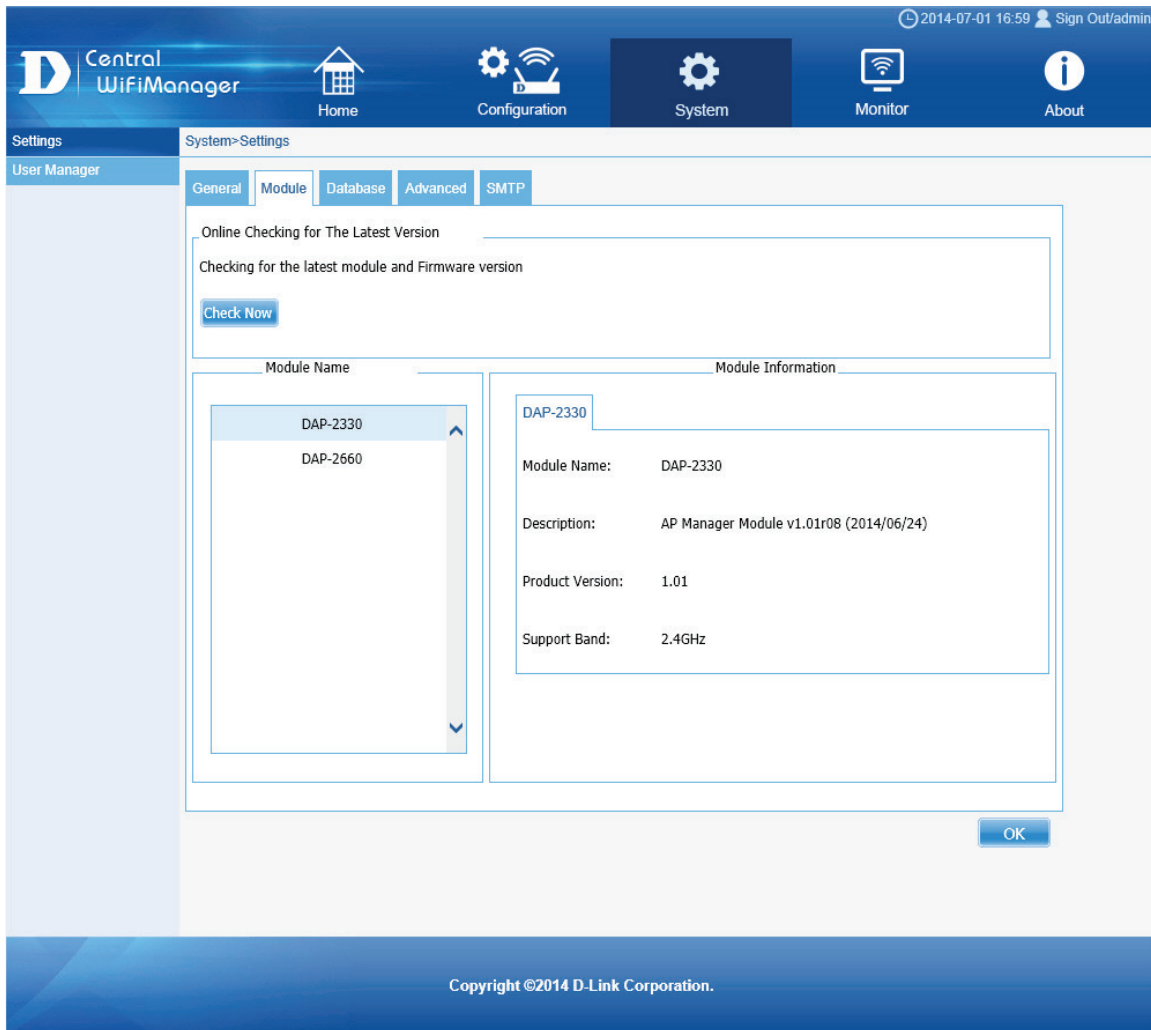
Figure 1-12 CWM Server Login

### 1.4.2. Remote login Central WiFiManager

Alternatively, from a remote computer, we can connect to the Central WiFiManager Server by entering the **IP address** or **Domain Name** of the computer that has the server application installed into the web browser, thus it is not needed to install the software on the remote computer. Open the web browser on the remote computer (Internet Explorer or Google Chrome are recommend) and enter for example **https://192.168.10.1** or **https://domain-name.com** (where **192.168.10.1** or **domain-name.com** is the IP address or domain name of the computer running the CWM server) in the web browser's address bar and press **ENTER** to enter the CWM management interface.

## 1.5. Check and Download AP Module Online

After logging into the D-Link Central WiFiManager Server, we can click on **System**, at the top, then **Settings** on the left, and then select the **Module** tab option, in the middle of the page, to access the following window.



**Figure 1-13 Update AP Module**


In the **Module** tab, a list of access point modules will be displayed in the **Module Name** section. Every different model of access point that can be managed by the Central WiFiManager Server requires the administrator to install the executable module file for that specific access point's model name.

For example, on this page we have two kinds of access point modules installed, the **DAP-2330** and the **DAP-2660**. This means that we can have multiple DAP-2330 and DAP-2660 access points installed on the network, but only required to install two modules, one for each type of access point. The module executable files for all the access points, supported in the application, can be downloaded from the D-Link website.

To keep the installed modules and firmware versions for access points up to date, click on the **Check Now** button.

Click the **OK** button to accept the changes made.

## 1.6. Create Site and Network, Configure SSID Settings

To create a new **Site** (D-Link), select **Configuration** and then click the  button. Multiple sites can be created for multi-tenant use.

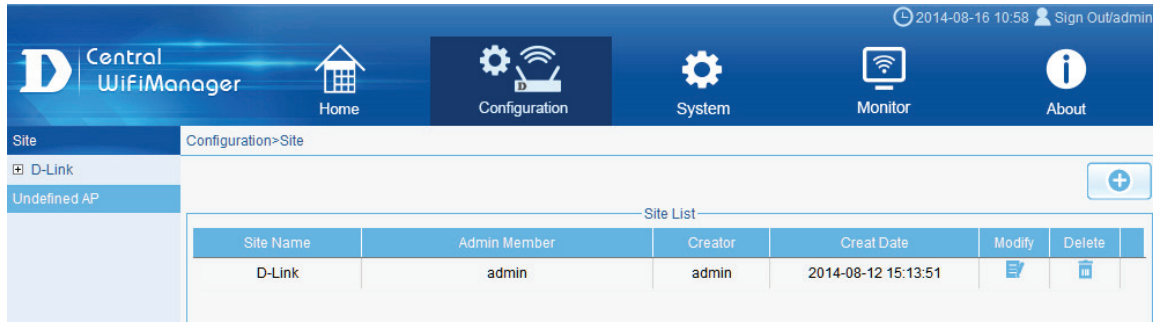


Figure 1-14 New Site (D-Link)

To create a new **Network (HQ)**, select the newly created **Site (D-Link)** and click the button. Multiple networks can be created for each site.

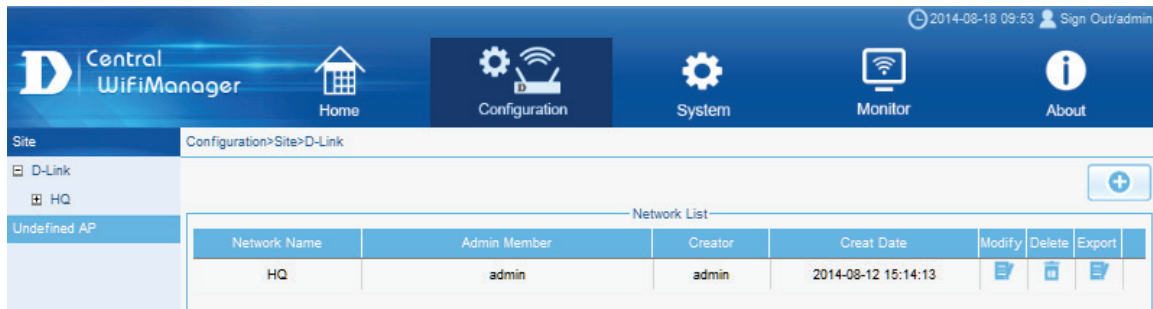


Figure 1-15 New Network (HQ)

After creating the new network (HQ), select it. Additional information will be displayed. For each network additional settings can be configured like **SSID**, **VLAN**, **Bandwidth Optimization**, **RF Optimization**, **Device Settings**, and more.

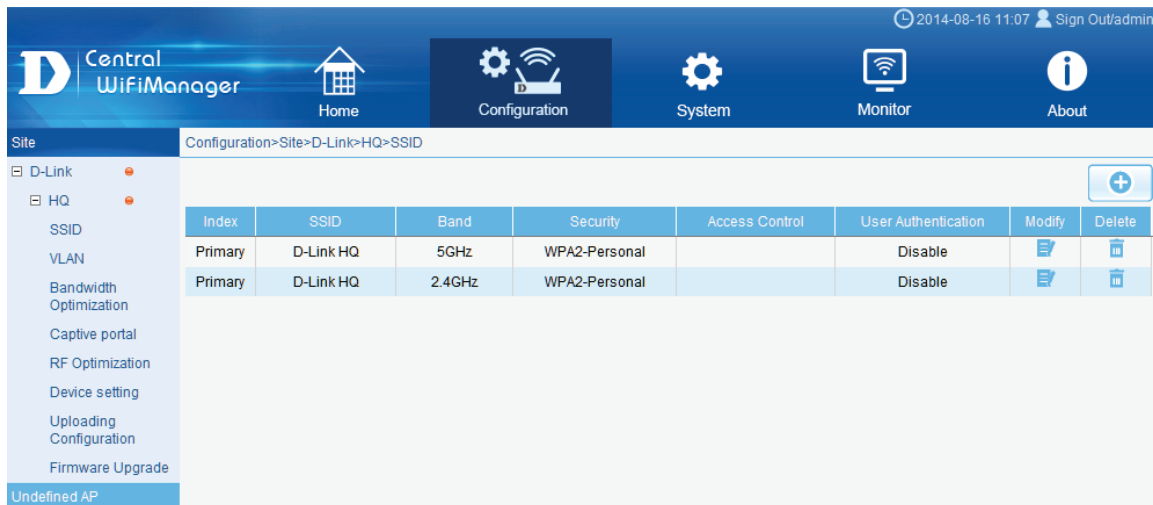


Figure 1-16 Network Configuration Options

To create a new 5GHz **SSID (D-Link HQ)**, select the newly created **Network (HQ)** and click the button. Select the **Band (5G)**, **Index (Primary)**, enter the **SSID (D-Link HQ)**, and configure the wireless security settings. In this example we used **WPA2-Personal** for wireless security. After selecting WPA-Personal, enter the **PassPhrase (12345678)** in the space provided. Click **Save** to apply the settings.

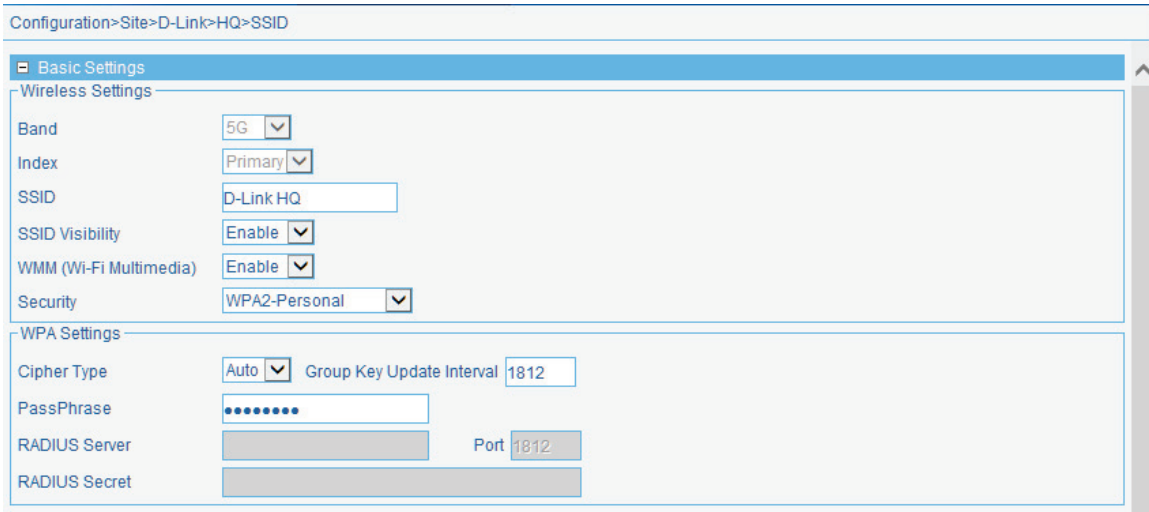


Figure 1-17 New SSID (5G)

To create a new 2.4GHz **SSID** (D-Link HQ), select the newly created **Network** (HQ) and click the button. Select the **Band** (2.4G), **Index** (Primary), enter the **SSID** (D-Link HQ), and configure the wireless security settings. In this example we used **WPA2-Personal** for wireless security. After selecting WPA-Personal, enter the **PassPhrase** (12345678) in the space provided. Click **Save** to apply the settings.

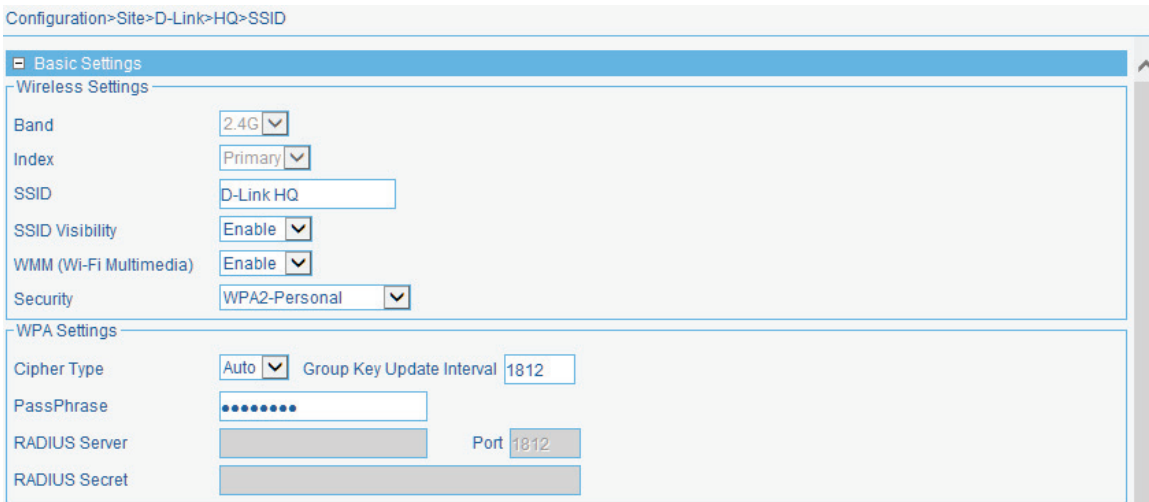


Figure 1-18 New SSID (2.4G)

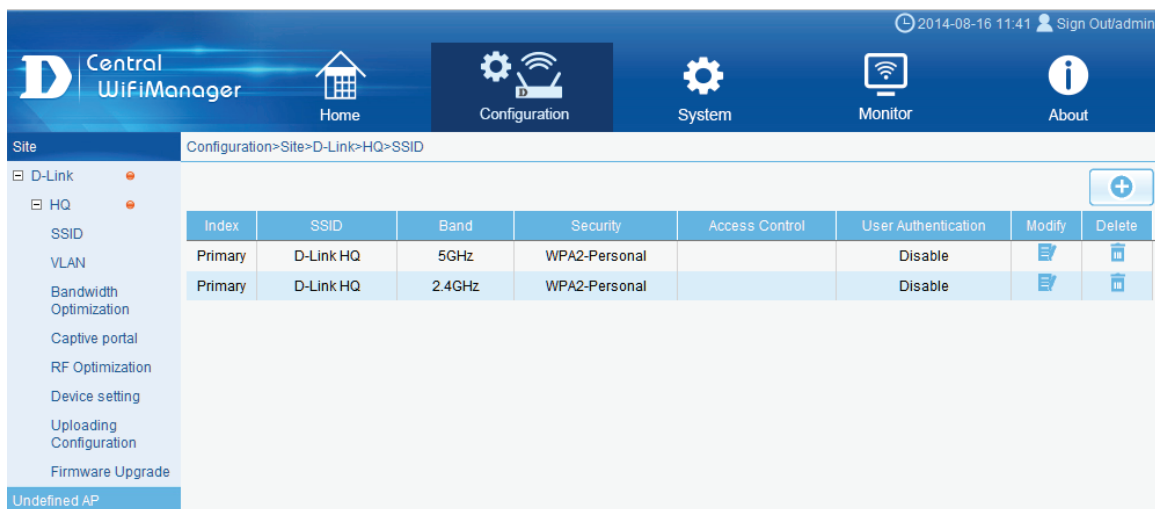


Figure 1-19 Network's SSID List

Because this configuration wasn't uploaded to the access points in this network, red circle icons (🔴) will be displayed right next to the **Network** (D-Link) and **Site** (HQ) names. In the next section, we'll discuss how to add new access

points to the network. To upload the new configuration to existing access points in the network select the **Uploading Configuration** option, on the left, and then select the **Run** option, and then click the **Complete** button to apply the new settings to the existing access points immediately.

In the **Uploading Configuration** page we can decide whether we need to apply the new configuration to existing access point in the network immediately or by schedule.

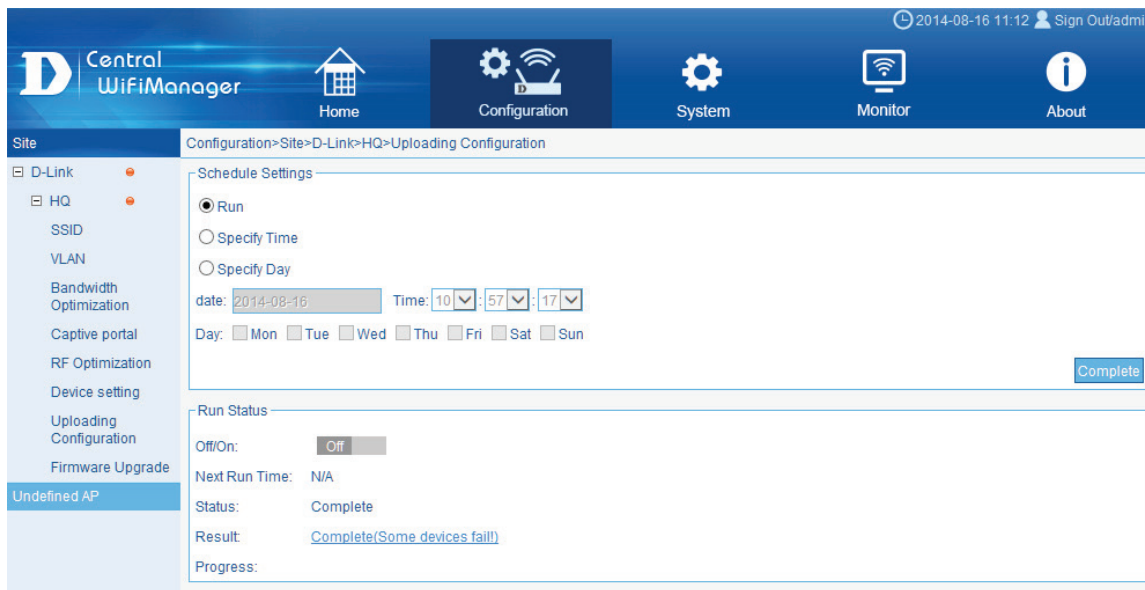


Figure 1-20 Uploading Configuration

## 1.7. Add Access Points in CWM using the Installation Tool

### 1.7.1. Export Network Profile from CWM to your Computer

To add new access points to the CWM, we have to export the network profile from CWM first. The exported file includes the authentication key and the IP address of the controller. Select **Configuration** and then click the **Export** (📄) icon to export the network profile to your computer.

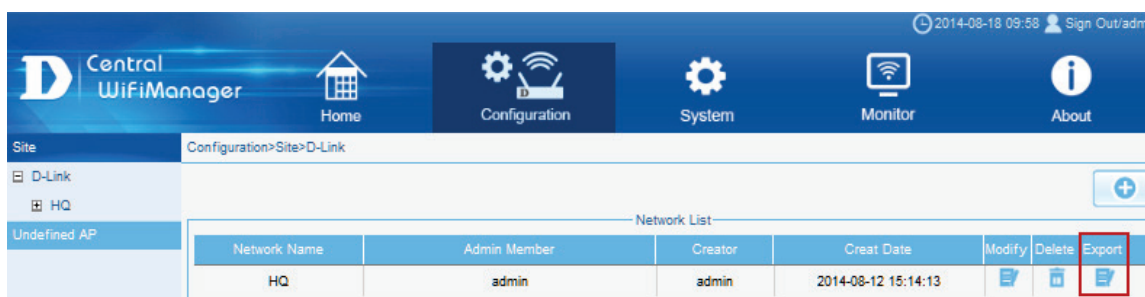


Figure 1-21 Export Network Profile

When access points are located on a public site and access to the CWM is over the Internet, ensure that the **Access Address** for the CWM is a **public** IP address or domain name and not a private IP address. To verify the Access Address navigate to **System > General > Connection Settings** and double check the **Access Address** field.



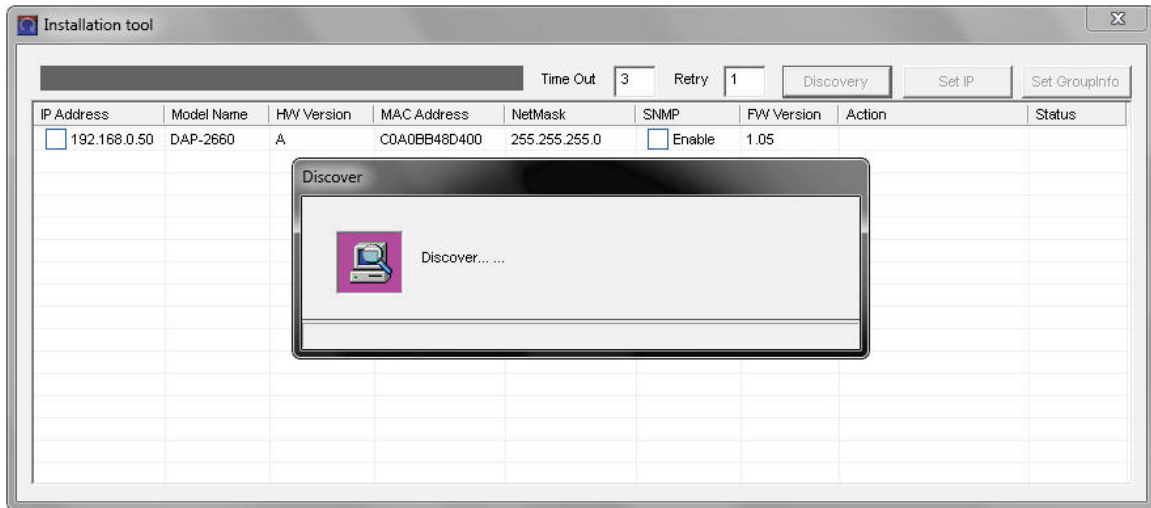


Figure 1-24 AP Installation Tool (Discover)

After this utility found access point, they will be displayed and can be configured.

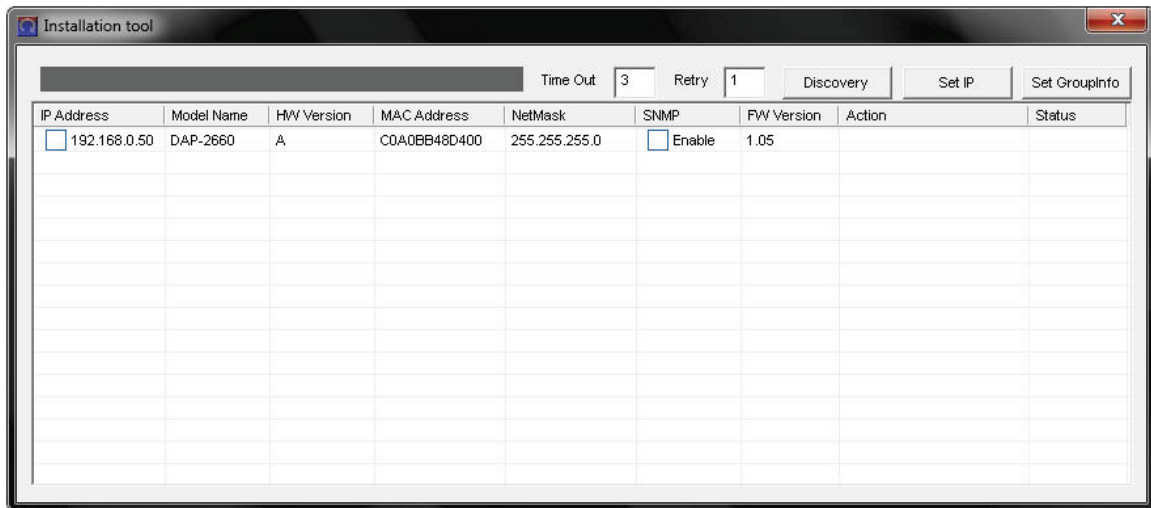


Figure 1-25 AP Installation Tool (Found)

To modify the IP address of the newly discovered access point, select it and click the **Set IP** button. Enter the new IP address, subnet mask, gateway address and primary DNS address in the spaces provided. Click **OK** to accept the changes made.

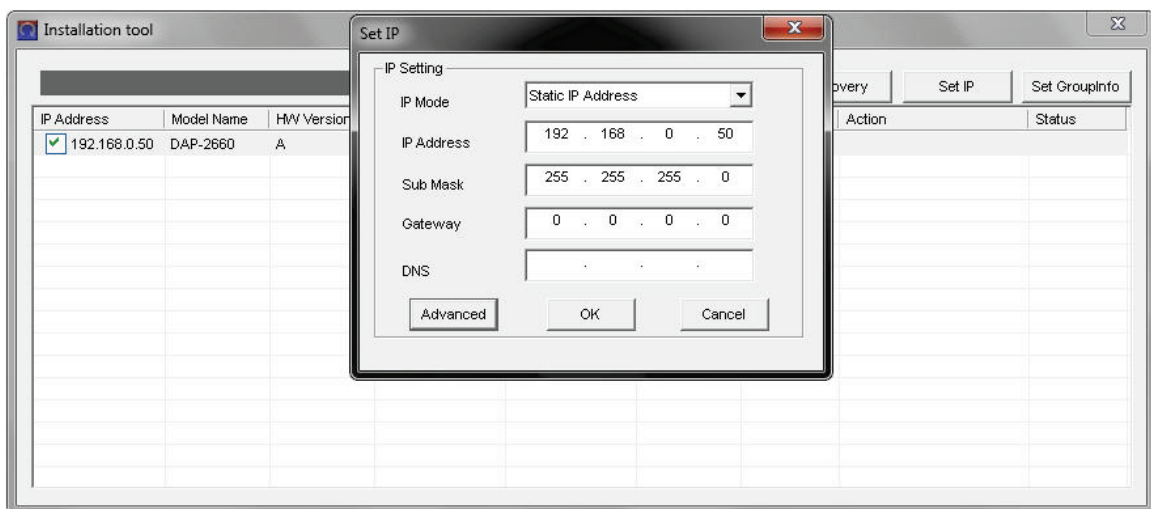


Figure 1-26 AP Installation Tool (Set IP)

After clicking the **OK** button to set the IP address settings, the access point will be configured and some time will be given for the access point to restart after the new IP address settings was applied. The **Status** parameter will display



the progress of the IP address configuration and access point reboot.

This utility also allows us to upload the network data file directly to the access point to configure the group information that this access point will use to identify in which network it belongs. Click the **Set GroupInfo** button to upload the network data file. After click the **Set GroupInfo** button, we can click on the “...” button to navigate to the saved network data file on the computer and then upload it.

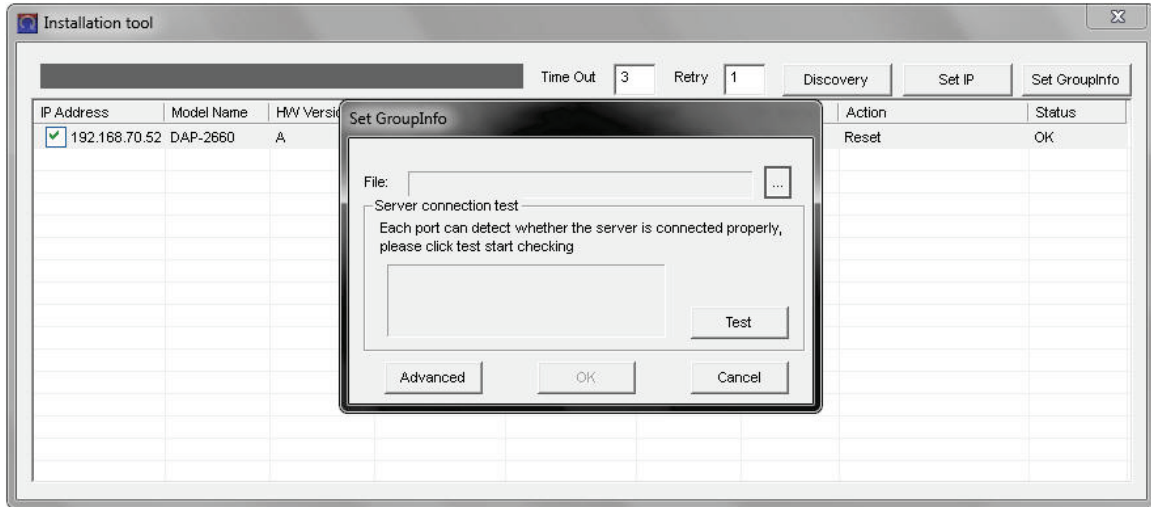


Figure 1-27 AP Installation Tool (Set Groupinfo)

Click the **Test** button to test if the data file is in fact a valid network data file. After clicking the **Test** button to successfully test if the network data file is valid, the following message will be displayed. Click the **OK** button to initiate the upload.

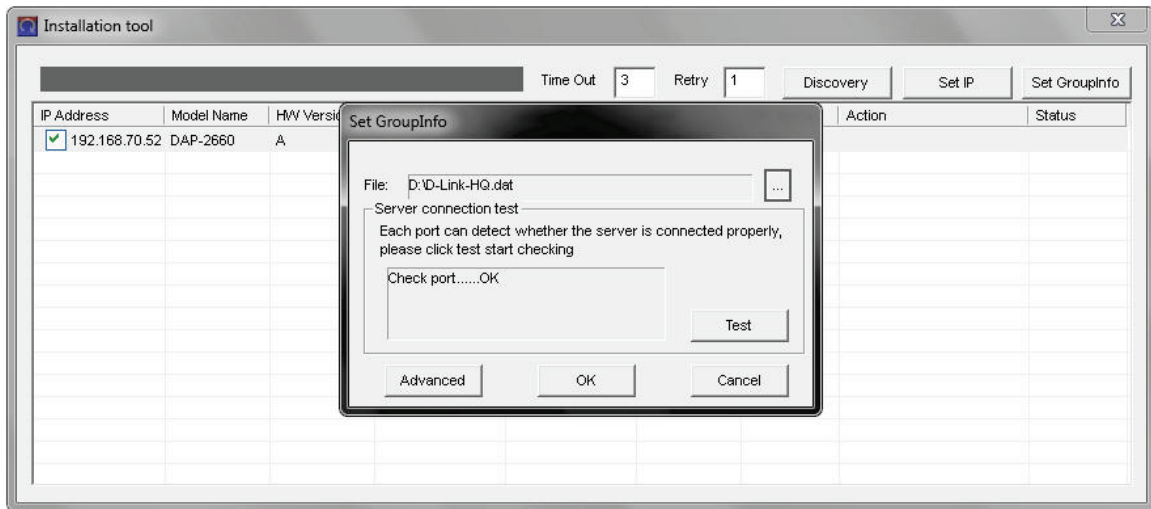


Figure 1-28 AP Installation Tool (Test, OK)

After clicking the **OK** button, the network data file will be uploaded, the access point will be configured based on the settings within the data file, and will then reboot. The **Status** parameter will display the progress of the configuration.

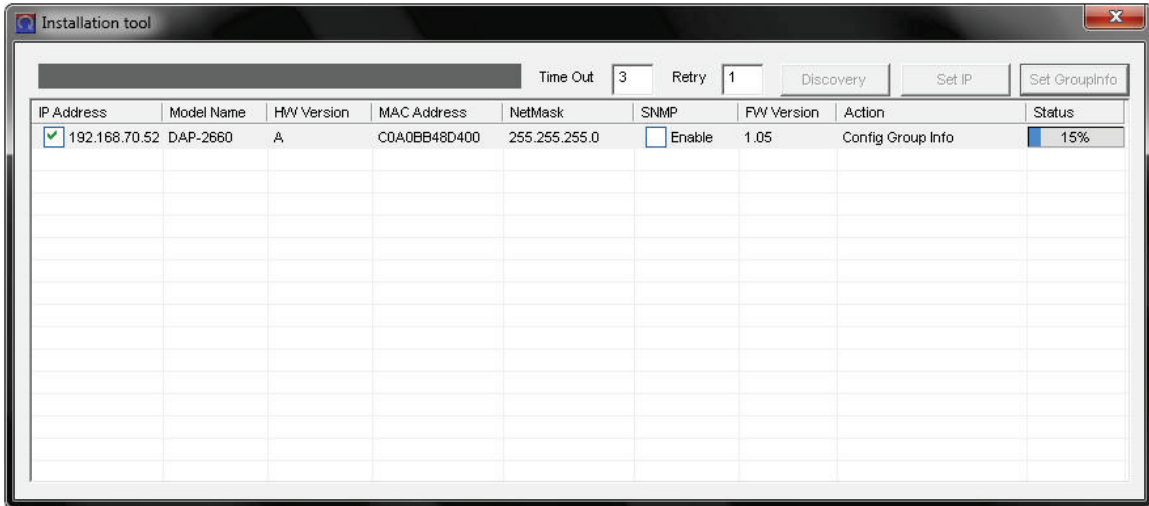


Figure 1-29 AP Installation Tool (Uploading, Reboot)

### 1.7.3. Verify Access Points Managed by the CWM

To verify which access points are connected to which sites, navigate to **Home > Network (Site) > Site (D-Link)**. Online access point will display a blue icon (●) in the **Status** field and offline access point will display a grey icon (●) in the **Status** field.

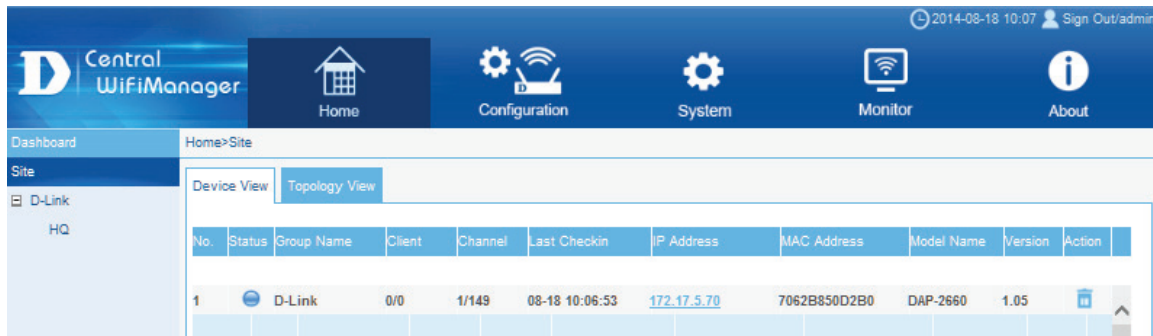


Figure 1-30 Verify Access Points

Additional information displayed for each access point on this page is the **Group Name**, **Client**, **Channel**, **Last Check-in**, **Channel**, **IP Address**, **MAC Address**, **Model Name** and firmware **Version**.

## Scenario 2 - Captive Portal and User Authentication

The **Captive Portal** can provide wireless access to guest users. This feature is frequently used in enterprise, campus and hospital network environments. The objectives in this scenario are as follow:

- Understand how to use captive portal
- Understand how to configure local data base and passcode authentication.

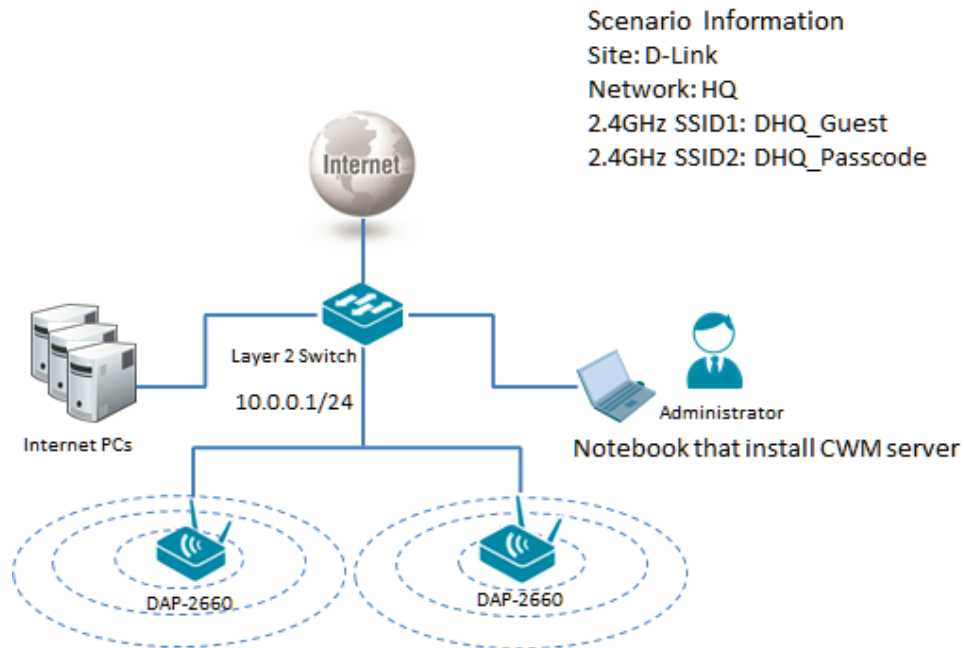


Figure 2-1 Captive Portal and User Authentication Network Layout

The overview of the configuration steps for Captive Portal is as follows:

1. [Configure Captive Portal](#)
2. [Configure Local Database Authentication](#)
3. [Configure Passcode Authentication](#)

## 2.1. Configure Captive Portal

To configure the **Captive Portal** settings, navigate to **Configuration > Site > Network (D-Link) > Site (HQ)**. Select the **Web Redirection** option to enable web redirection. Enter a **Web Site** (www.google.com) in the space provided. To use an image file, click the **Browse** button and upload the image file (located on the local computer). Click the **Save** button to accept the changes made.

Figure 2-2 Captive Portal Settings

## 2.2. Configure Local Database Authentication

In this section we'll create a new guest SSID and configure this SSID to use the local database for authentication. To create a new SSID, navigate to **Configuration > Site (D-Link) > Network (HQ)**.

Index	SSID	Band	Security	Access Control	User Authentication	Modify	Delete
Primary	D-Link HQ	5GHz	WPA2-Personal		Disable		
Primary	D-Link HQ	2.4GHz	WPA2-Personal		Disable		

Figure 2-3 Create Guest SSID (Local Database Authentication)

To create a new 2.4GHz guest **SSID** (DHQ\_Guest), select the existing **Network (HQ)** and click the button. Select the **Band** (2.4G), **Index** (SSID1), enter the **SSID** (DHQ\_Guest), and configure the wireless security settings. In this example we used **Open System** for wireless security. Click **Save** to apply the settings.

Figure 2-4 Configure Guest SSID

In **User Authentication** section, select **Username/Password**. To prevent guest users from accessing your intranet, enter the intranet's IP ranges in the **Restricted Subnets** spaces provided. Enter the new guest account's **Username** and **Password** in the spaces provided. Select the **Group** called **Guest** and click the **Add** button to add the new guest user account to the table. Click the **Save** button to accept the changes made.

If the **Group** called **Manager** was selected, this guest user account would have had access to the restricted subnets.

**User Authentication**

Authentication Type: **Username/Password** Each Configuration Only Allow One SSID to Use Passcode For Authentication

Local Settings

IP Filter Settings

Restricted Subnets (example:192.168.0.0/16)

1. 10.1.1.0/24	2. [ ]	3. [ ]	4. [ ]
----------------	--------	--------	--------

User/Password Rule Settings

Username:

Password:

Group:

Username	Group	Modify	Delete

Figure 2-5 Configuration Guest SSID User Authentication

Navigate to **Configuration > Site (D-Link) > Network (HQ)** and select the **Upload Configuration** option in the left menu. Then select the **Run** option and click the **Complete** button to upload the modified settings to the access points associated with this network.

Central WiFiManager

Home Configuration System Monitor About

Site Configuration>Site>D-Link>HQ>Uploading Configuration

Schedule Settings

Run

Specify Time

Specify Day

date: 2014-08-18 Time: 10:38:33

Day:  Mon  Tue  Wed  Thu  Fri  Sat  Sun

Run Status

Off/On:

Next Run Time: N/A

Status: Complete

Result: [Success\(Click to View Result\)](#)

Progress:

Figure 2-6 Uploading Configuration

## 2.3. Configure Passcode Authentication

### 2.3.1. Configure SSID for Passcode Authentication

In this section we'll create a new guest SSID and configure this SSID to use passcode authentication. To create a new SSID, navigate to **Configuration > Site (D-Link) > Network (HQ)**.

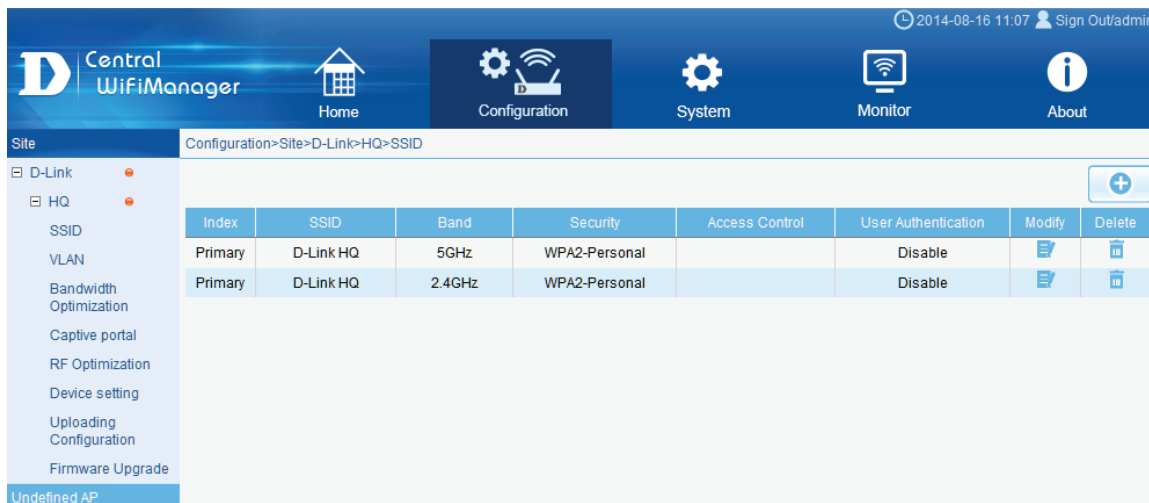


Figure 2-7 Create Guest SSID (Passcode)

To create a new 2.4GHz guest **SSID** (DHQ\_Passcode), select the existing **Network** (HQ) and click the button. Select the **Band** (2.4G), **Index** (SSID2), enter the **SSID** (DHQ\_Passcode), and configure the wireless security settings. In this example we used **Open System** for wireless security. Click **Save** to apply the settings.

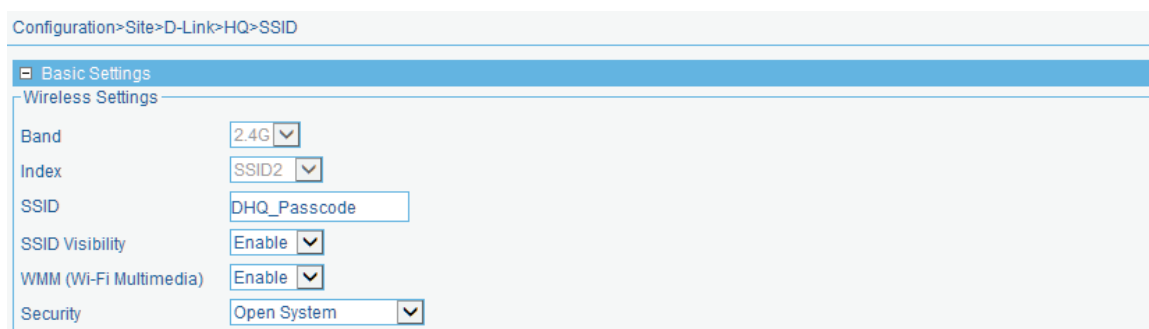


Figure 2-8 Configure Guest SSID (Passcode)

In **User Authentication** section, select **Passcode**. Click the **Save** button to accept the changes made.

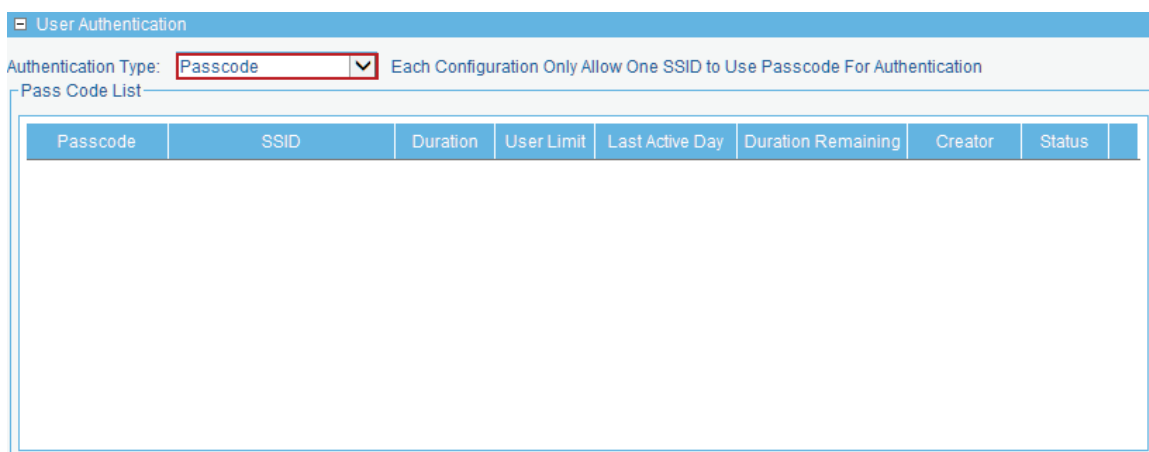


Figure 2-9 User Authentication (Passcode)

### 2.3.2. Create Front Desk Account

To create a new **Front Desk User Account** navigate to **System > User Manager** and click the button.

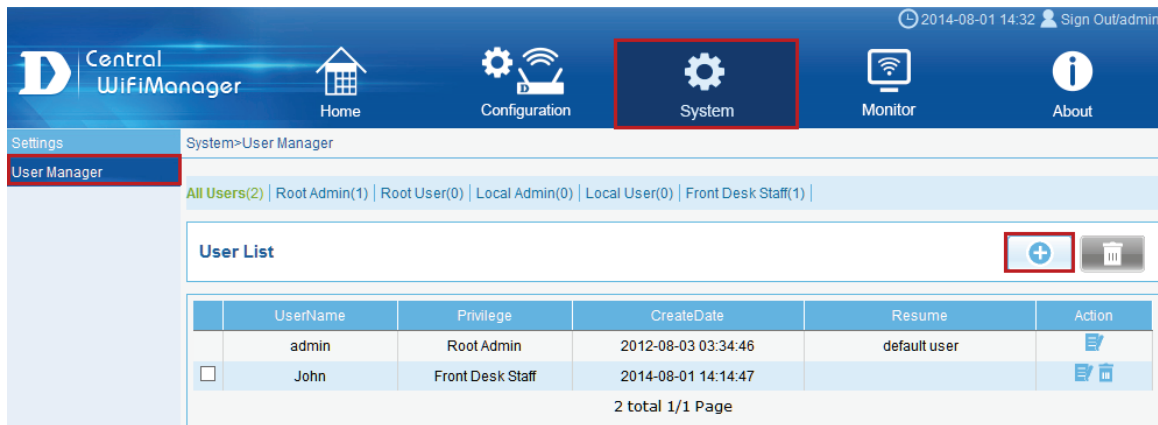


Figure 2-10 User Manager

Enter the **UserName** (John) and **Password** (1234) for this new account in the spaces provided. Select the **Front Desk Staff** option as the **Privilege** and enter the new account's **E-mail** address in the space provided. Click the **OK** button create the new user account.

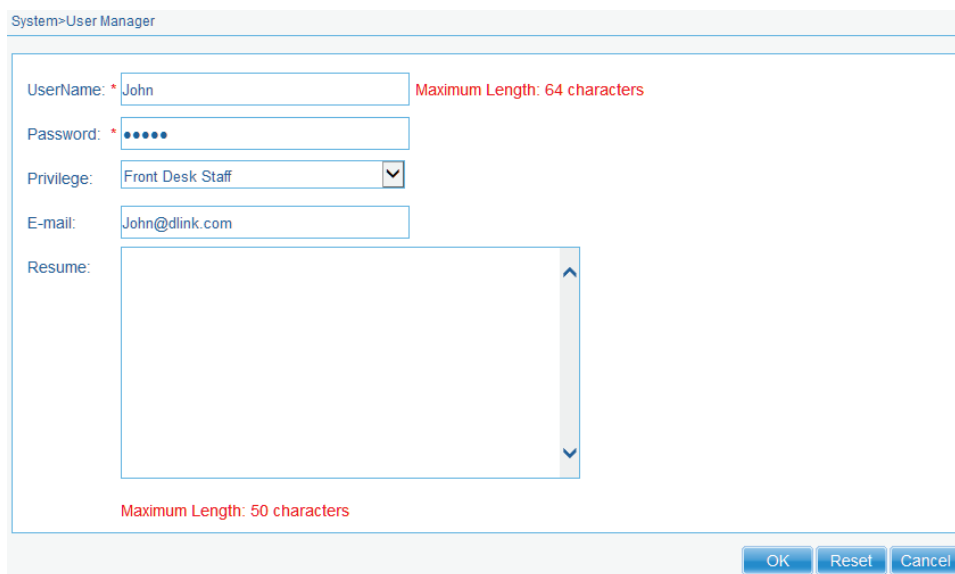


Figure 2-11 Create New Front Desk Account

### 2.3.3. Add the Front Desk Account to the Site and Network

To add the **Front Desk Account** to the site and network navigate to **Configuration > Site** (D-Link) and click the **Modify** icon (✎).

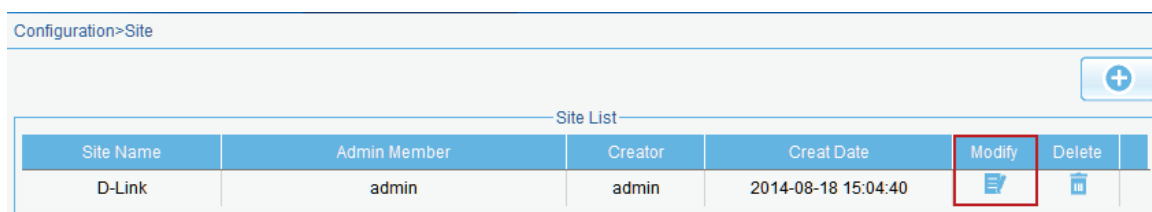


Figure 2-12 Add Front Desk Account to Site (Step 1)

After clicking the modify icon (✎), select the **Front Desk Account** and add it to the selected table by click the **>>** button. Click the **OK** button to accept the changes made.

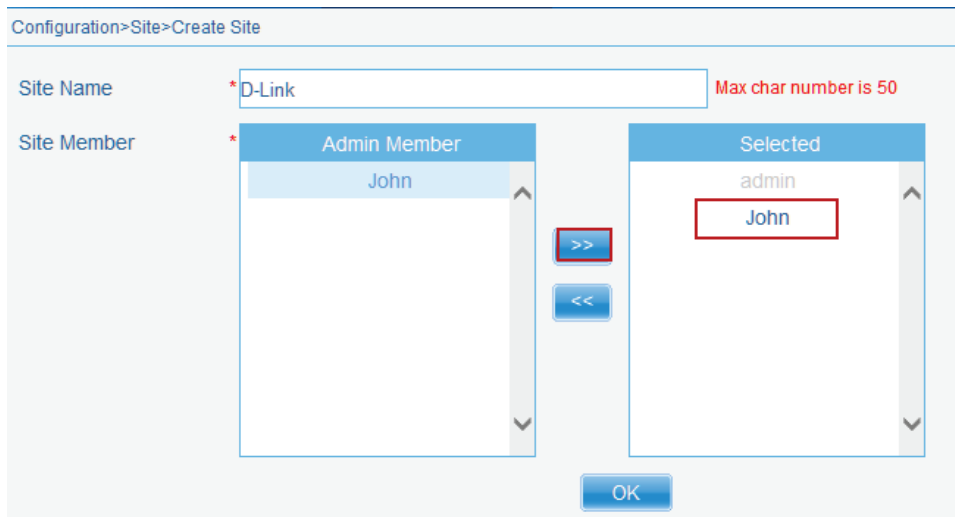


Figure 2-13 Add Front Desk Account to Site (Step 2)

Navigate to **Configuration > Site (D-Link) > Network (HQ)** and click the **Modify** icon (✎).

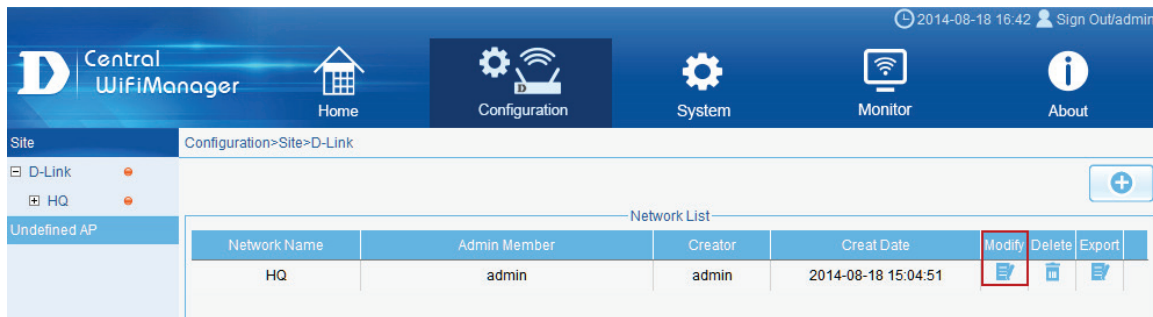


Figure 2-14 Add Front Desk Account to Network (Step 1)

After clicking the modify icon (✎), select the **Front Desk Account** and add it to the selected table by click the >> button. Click the **OK** button to accept the changes made.

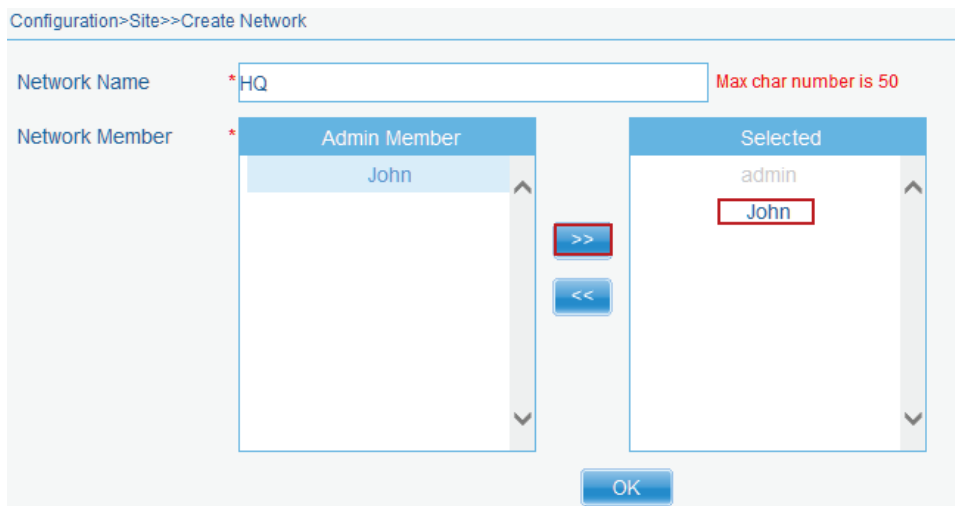


Figure 2-15 Add Front Desk Account to Network (Step 2)

### 2.3.4. Generate Passcode to Guest

To generate a **Passcode** for the **Front Desk Account**, we need to logout of the CWM and then log back into the CWM using the Front Desk Account's username and password. After logging back in, enter the **Passcode Quantity** (10), **Duration** (24) and **Device Limit** (2) information in the spaces provided; and click the **Generate** button.



Frontdesk>D-Link>HQ>Generate Passcode

Ticket Settings

SSID:

Security Key:   Display Security Key

Passcode Quantity:

Duration:  Hours


Last Active Day:

Device Limit:

Figure 2-16 Generate Passcode


On the **View** page, a list of generated passcodes for this front desk account will be displayed.

Frontdesk>D-Link>HQ>View

Passcode List 

<input type="checkbox"/>	Passcode	SSID	Duration	User Limit	Last Active Day	Duration Remaining	Creator	Status	Edit	Delete
<input type="checkbox"/>	7351	DHQ_Passcode	24	2	14-09-30	not active	John			
<input type="checkbox"/>	4281	DHQ_Passcode	24	2	14-09-30	not active	John			
<input type="checkbox"/>	4669	DHQ_Passcode	24	2	14-09-30	not active	John			
<input type="checkbox"/>	6470	DHQ_Passcode	24	2	14-09-30	not active	John			
<input type="checkbox"/>	4320	DHQ_Passcode	24	2	14-09-30	not active	John			
<input type="checkbox"/>	3522	DHQ_Passcode	24	2	14-09-30	not active	John			
<input type="checkbox"/>	5637	DHQ_Passcode	24	2	14-09-30	not active	John			
<input type="checkbox"/>	9535	DHQ_Passcode	24	2	14-09-30	not active	John			
<input type="checkbox"/>	4295	DHQ_Passcode	24	2	14-09-30	not active	John			
<input type="checkbox"/>	6824	DHQ_Passcode	24	2	14-09-30	not active	John			

Figure 2-17 Display Passcodes (Front Desk Account)

Administrators can also view the passcode list when logged back into the CWM as administrator. To view the passcode list as administrator, navigate to **Configuration > Site (D-Link) > Network (HQ) > SSID (DHQ\_Passcode)**. Click the **Modify** icon () and in the **User Authentication** section the list of passcodes will be displayed.

User Authentication

Authentication Type:   Each Configuration Only Allow One SSID to Use Passcode For Authentication

Pass Code List

Passcode	SSID	Duration	User Limit	Last Active Day	Duration Remaining	Creator	Status
7351	DHQ_Passcode	24	2	14-09-30	not active	John	
4281	DHQ_Passcode	24	2	14-09-30	not active	John	
4669	DHQ_Passcode	24	2	14-09-30	not active	John	
6470	DHQ_Passcode	24	2	14-09-30	not active	John	
4320	DHQ_Passcode	24	2	14-09-30	not active	John	
3522	DHQ_Passcode	24	2	14-09-30	not active	John	
5637	DHQ_Passcode	24	2	14-09-30	not active	John	
9535	DHQ_Passcode	24	2	14-09-30	not active	John	

Figure 2-18 Display Passcodes (Administrator Account)

Navigate to **Configuration > Site (D-Link) > Network (HQ)** and select the **Upload Configuration** option in the left menu. Then select the **Run** option and click the **Complete** button to upload the modified settings to the access points associated with this network.

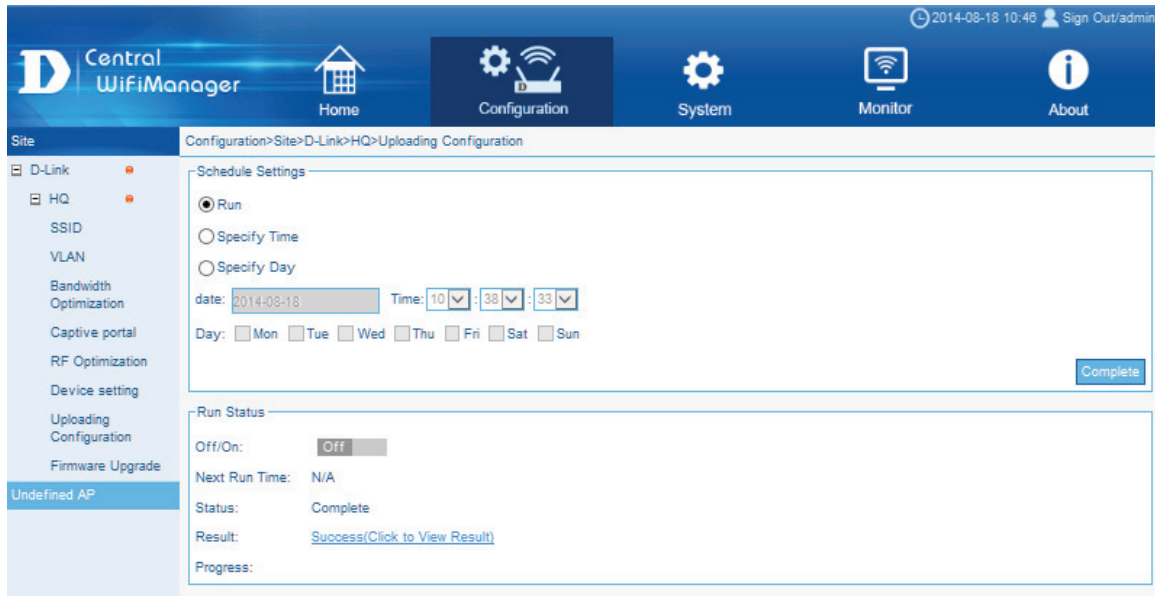


Figure 2-19 Uploading Configuration

## Scenario 3 - Bandwidth Optimization

Bandwidth optimization allows administrators to control the wireless bandwidth usage. The **Downlink Bandwidth** and **Uplink Bandwidth** options allows for the limiting of the total bandwidth of access points. For more information about the various bandwidth optimization rules available in the CWM, refer to the *Central WiFiManager User Manual*.

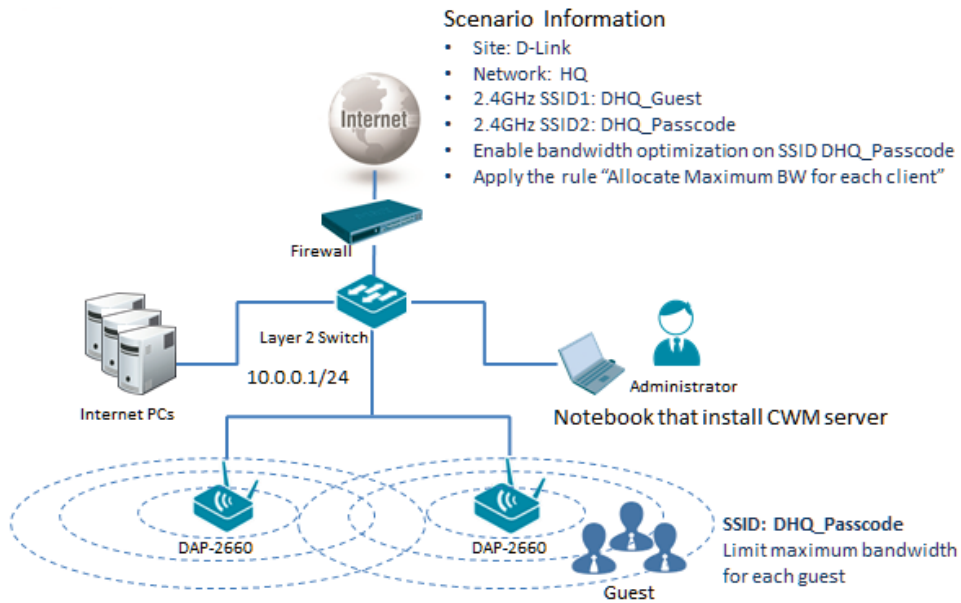


Figure 3-1 Bandwidth Optimization Network Layout

### 3.1. Configure Bandwidth Optimization

To configure the Bandwidth Optimization settings, navigate to **Configuration > Site (D-Link) > Network (HQ) > Bandwidth Optimization**. At **Enable Bandwidth Optimization** select **Enable**. In the **Downlink Bandwidth** and **Uplink Bandwidth** fields enter 800Mbps. This is the bandwidth for whole AP. Select the **Rule Type** option called **Allocate maximum BW for each station**. Then select **2.4GHz** as the **Band**, and **SSID2 (DHQ\_Passcode)** as the **SSID**. In the **Downlink Speed** and **Uplink Speed** fields enter **1Mbps/sec**. Click the **Add** button to create the new rule and then click the **Save** button to accept the changes made.

The screenshot shows the 'Bandwidth Optimization' configuration page. At the top, the breadcrumb is 'Configuration>Site>D-Link>HQ>Bandwidth Optimization'. The 'Enable Bandwidth Optimization' dropdown is set to 'Enable'. Below it, 'Downlink Bandwidth' and 'Uplink Bandwidth' are both set to '800' Mbits/sec. The 'Add Bandwidth Optimization Rule' section contains: 'Rule Type' set to 'Allocate maximum BW for each station', 'Band' set to '2.4 GHZ', 'SSID' set to 'SSID 2', 'Downlink Speed' set to '1' Mbits/sec, and 'Uplink Speed' set to '1' Mbits/sec. There are 'Add' and 'Clear' buttons. Below this is a table titled 'Bandwidth Optimization Rules' with columns: Band, Type, SSID, Downlink Speed, Uplink Speed, Modify, and Delete. The table is currently empty.

Figure 3-2 Bandwidth Optimization Settings

Navigate to **Configuration > Site (D-Link) > Network (HQ)** and select the **Upload Configuration** option in the left menu. Then select the **Run** option and click the **Complete** button to upload the modified settings to the access points associated with this network.

The screenshot shows the 'Uploading Configuration' page. The breadcrumb is 'Configuration>Site>D-Link>HQ>Uploading Configuration'. The 'Schedule Settings' section has 'Run' selected with a radio button. Other options are 'Specify Time' and 'Specify Day'. The date is '2014-08-18' and the time is '10:38:33'. There are checkboxes for days of the week (Mon, Tue, Wed, Thu, Fri, Sat, Sun). A 'Complete' button is at the bottom right. The 'Run Status' section shows 'Off/On:' set to 'Off', 'Next Run Time:' as 'N/A', 'Status:' as 'Complete', and 'Result:' as 'Success(Click to View Result)'. There is a 'Progress:' label at the bottom.

Figure 3-3 Uploading Configuration

## Scenario 4 - Add Remote AP for CWM Management

### Management

The CWM can manage remote access points over a site-to-site VPN or behind a NAT router without a VPN connection.

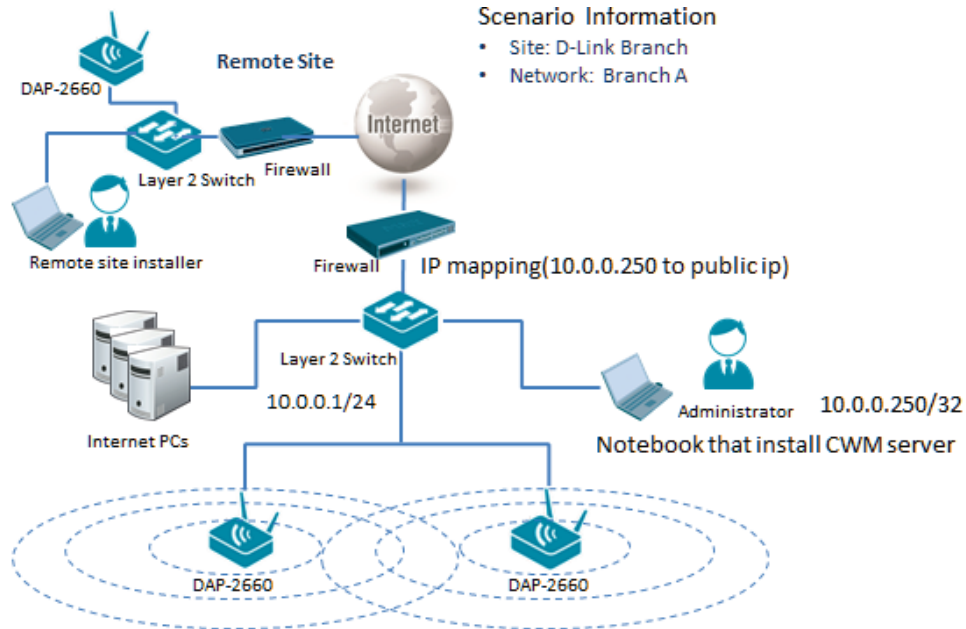


Figure 4-1 Remote AP for CWM Management Network Layout

The overview of the configuration steps for this configuration is as follows:

1. [Configure Network Device Settings](#)
2. [Create New Site and Network for Branch Office](#)
3. [Export Network Profile then Import the Profile to the Remote AP](#)

## 4.1. Configure Network Device Settings

The following port numbers must be opened in the firewall at the site where the CWM server is located in order for remote access points to access the CWM server.

- UDP 161 (SNMP port)
- UDP 162 (SNMP trap port)
- UDP 514 (Syslog port)
- UDP 8090 (Listen port)
- UDP 64768 (Service port)
- TCP 9000, Enable ftp-ALG (Manager port)
- TCP 443 (HTTPS, Management port)

Additionally, if the CWM server uses a private IP address, the public IP address must be mapped to the private IP address on the firewall.

At remote site, the following ports also need to be opened.

- UDP 161 (SNMP port)
- UDP 162 (SNMP trap port)
- UDP 514 (Syslog port)
- UDP 8090 (Listen port)
- UDP 64768 (Service port)
- TCP 9000, Enable ftp-ALG (Manager port)

## 4.2. Create New Site and Network for Branch Office

To create a new **Site** (D-Link Branch), select **Configuration** and then click the  button.

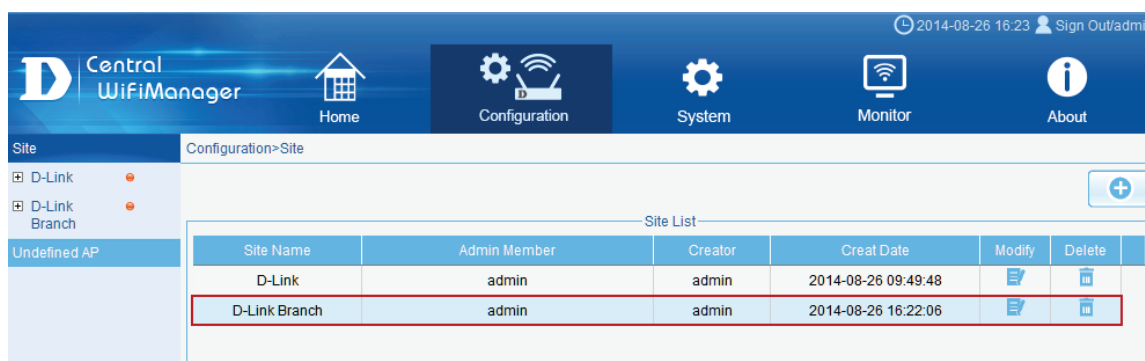



Figure 4-2 Create New Site (D-Link Branch)

To create a new **Network** (Branch-A), select the newly created **Site** (D-Link Branch) and click the  button.

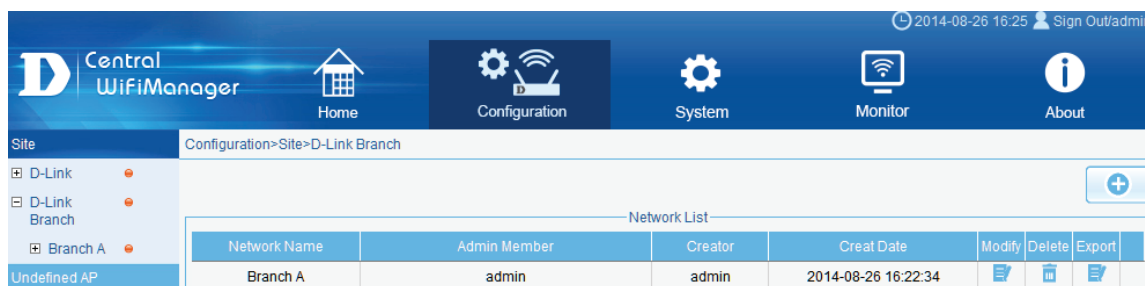



Figure 4-3 Create New Network (Branch-A)

## 4.3. Export Network Profile then Import the Profile to the Remote AP

To export the network profile select **Configuration > Site** (D-Link Branch) and then click the **Export** () icon to export the network profile to your computer. Provide this exported network profile file to the remote site installer.

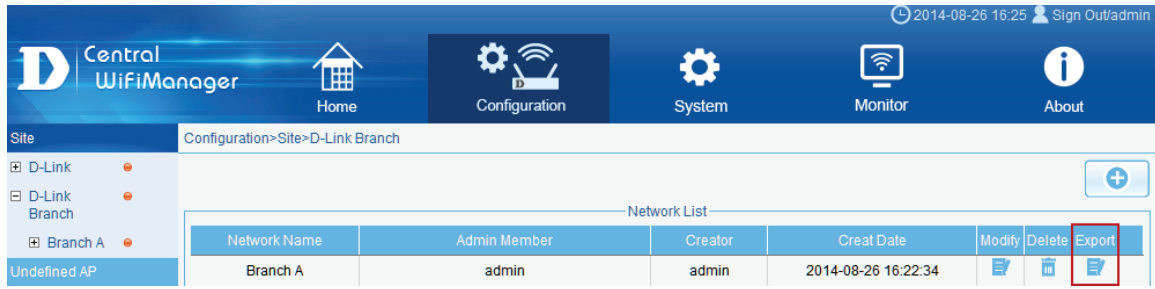


Figure 4-4 Export Network Profile to PC

At remote site, ensure that the exported network profile file is available on the computer used to configure the access point(s). Run the **Access Point Installation Tool**.

After opening the Access Point Installation Tool, the following window will be available. Click the **Discovery** button, to scan for D-Link access points that are connected to the network with an Ethernet cable.

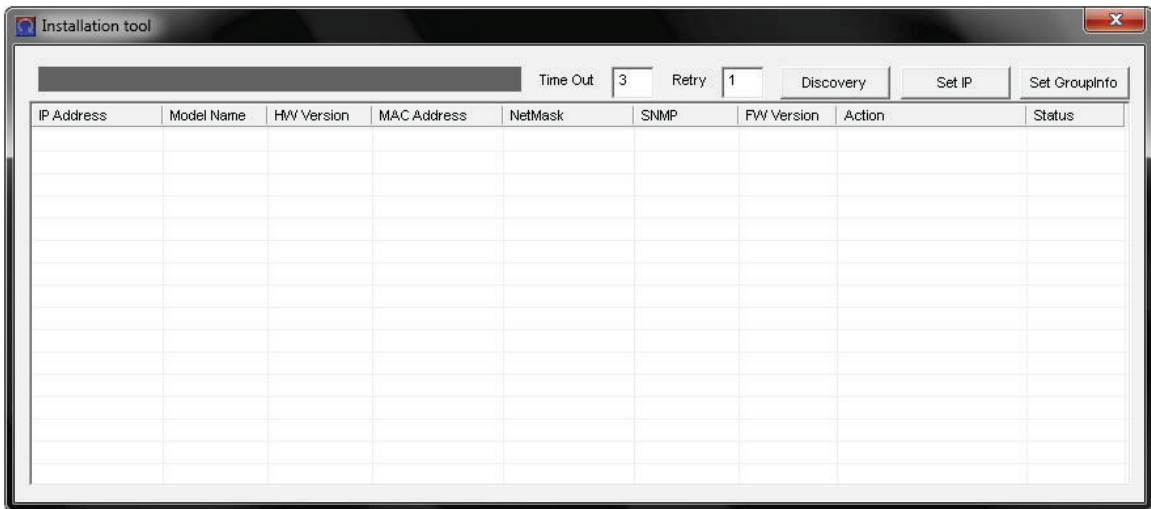


Figure 4-5 AP Installation Tool (Open)

After clicking the **Discovery** button, this utility will scan the LAN (Layer 2) network for D-Link access points that are connected to the network with an Ethernet cable.

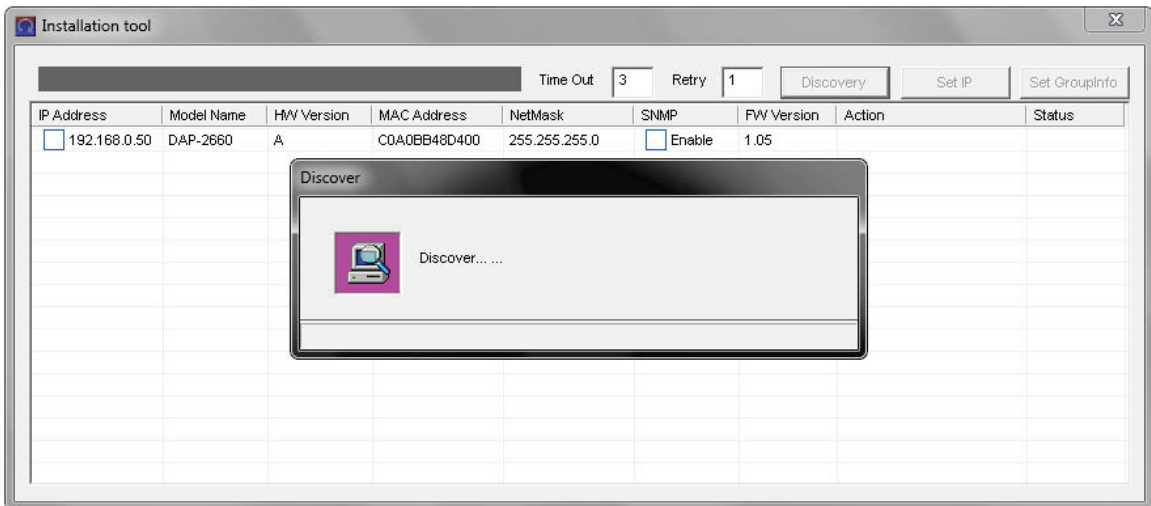


Figure 4-6 AP Installation Tool (Discover)

After this utility found access point, they will be displayed and can be configured.

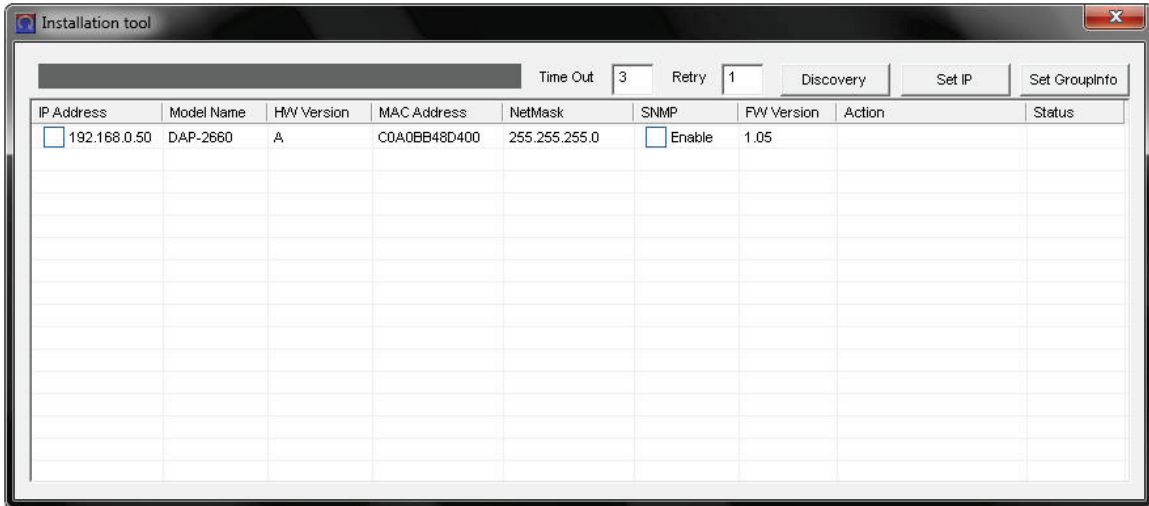


Figure 4-7 AP Installation Tool (Found)

To modify the IP address of the newly discovered access point, select it and click the **Set IP** button. Enter the new IP address, subnet mask, gateway address and primary DNS address in the spaces provided. Click **OK** to accept the changes made.

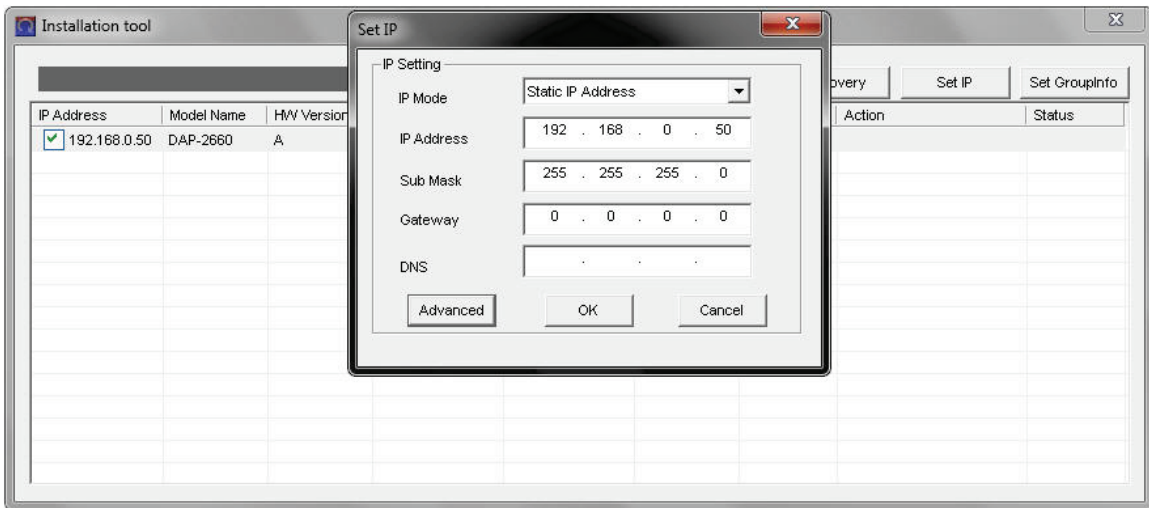


Figure 4-8 AP Installation Tool (Set IP)

After clicking the **OK** button to set the IP address settings, the access point will be configured and some time will be given for the access point to restart after the new IP address settings was applied. The **Status** parameter will display the progress of the IP address configuration and access point reboot.

This utility also allows us to upload the network data file directly to the access point to configure the group information that this access point will use to identify in which network it belongs. Click the **Set GroupInfo** button to upload the network data file. After click the **Set GroupInfo** button, we can click on the “...” button to navigate to the saved network data file on the computer and then upload it.



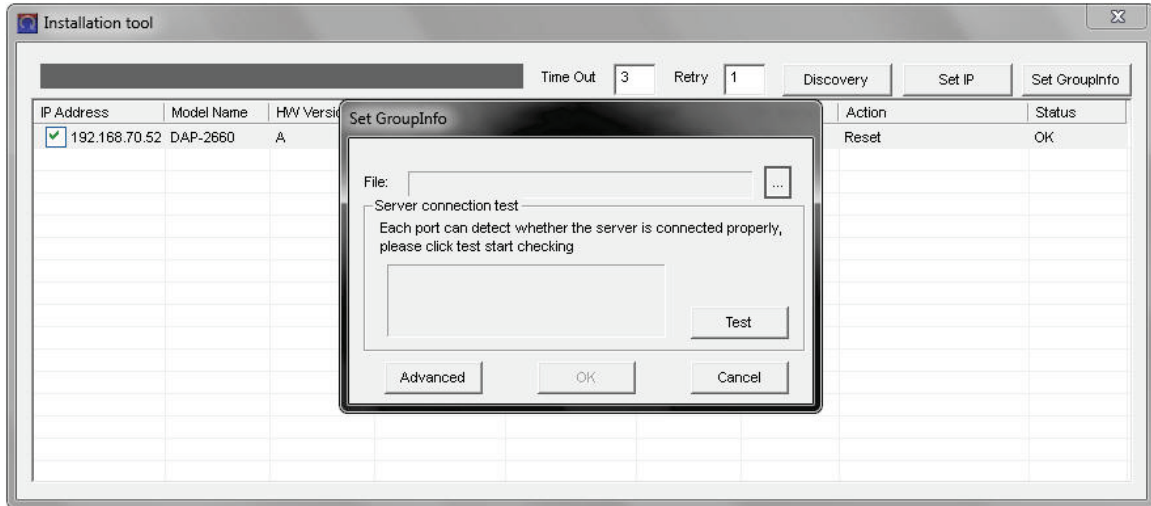


Figure 4-9 AP Installation Tool (Set GroupInfo)

Click the **Test** button to test if the data file is in fact a valid network data file. After clicking the **Test** button to successfully test if the network data file is valid, the following message will be displayed. Click the **OK** button to initiate the upload.

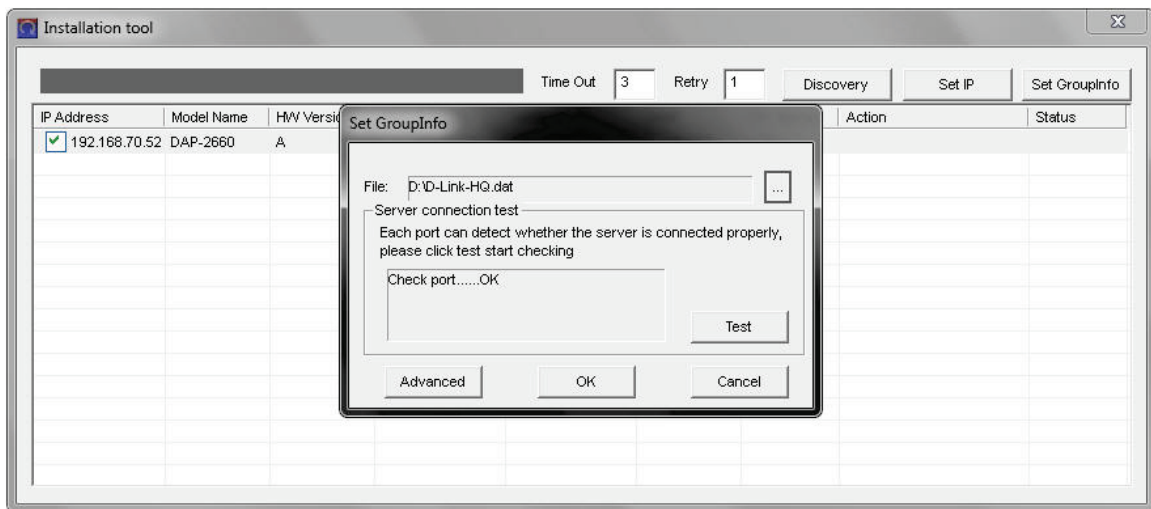


Figure 4-10 AP Installation Tool (Test, OK)

After clicking the **OK** button, the network data file will be uploaded, the access point will be configured based on the settings within the data file, and will then reboot. The **Status** parameter will display the progress of the configuration.

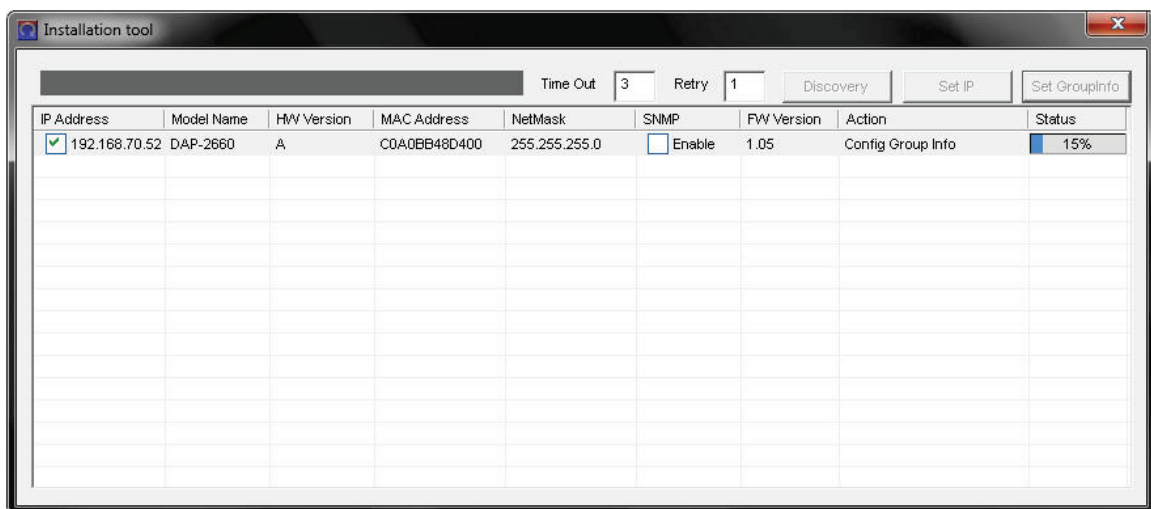


Figure 4-11 AP Installation Tool (Uploading, Reboot)