

## **Overview:**

This article will guide how to address the vulnerability of WiFi Protected Setup (WPS) against brute force.

## **Resolution:**

Wi-Fi Protected Setup (WPS) is a method for setting up a new wireless router for a home network that includes a way for users to set up the network easily via different methods, which include:

1. Push Button Configuration
2. Register Wireless Client PIN Number
3. Enter AP's PIN Number in Wireless Client

The WPS standard requires a PIN to be used during the device setup phase. The vulnerability discovered in WPS makes that PIN highly susceptible to brute force attempts. ZyXEL devices will protect themselves after several failed attempts to authenticate by entering a lock-down state.

During the lock-down state, all WPS attempts using the method 3 will not work. The WPS will return from the lock-down state after a predetermined time period or users need to disable and enable WPS again. While the device is in a lock-down state, users can still use the Push Button Configuration method to connect to the wireless network.

Since only the Enter AP's PIN Number in Wireless Client method is vulnerable to brute force attack, ZyXEL Strongly recommends disabling this function to best protect your network.

## **Disable SOP**

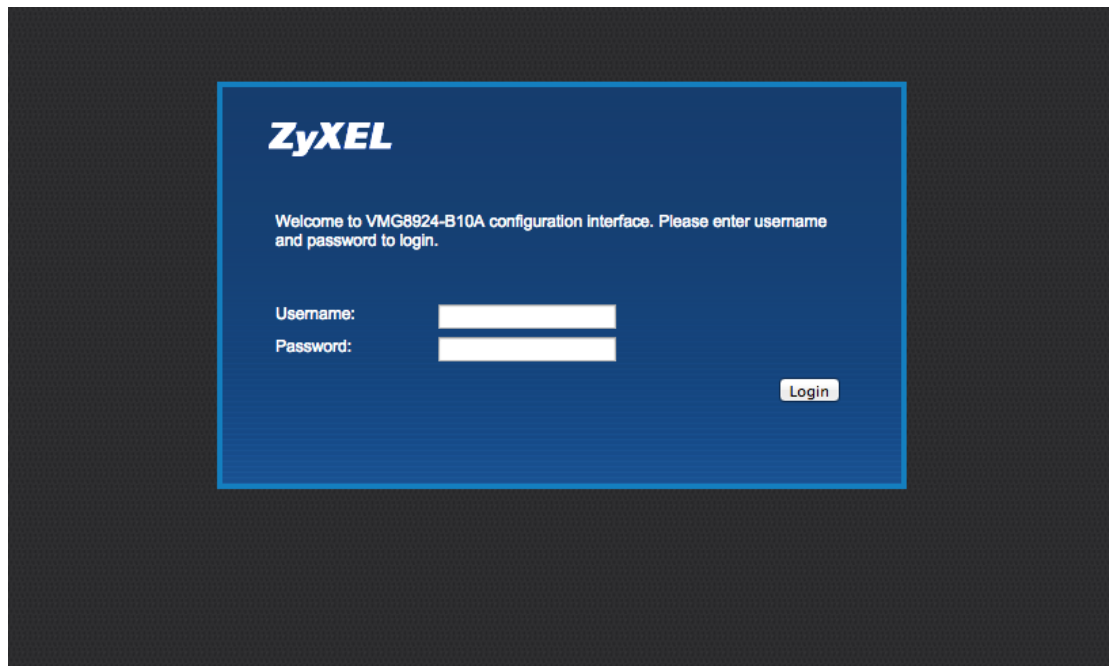
Below are some step by step SOP that shown how to disable WPS for ZyXEL devices.

- VMG8324/VMG8924-Bx0A series and VMG1312-Bx0A series
- AMG1202/AMG1302/AMG1312-T10B series
- NBG Series devices
- SBG3x00 series
- LTE6101 series

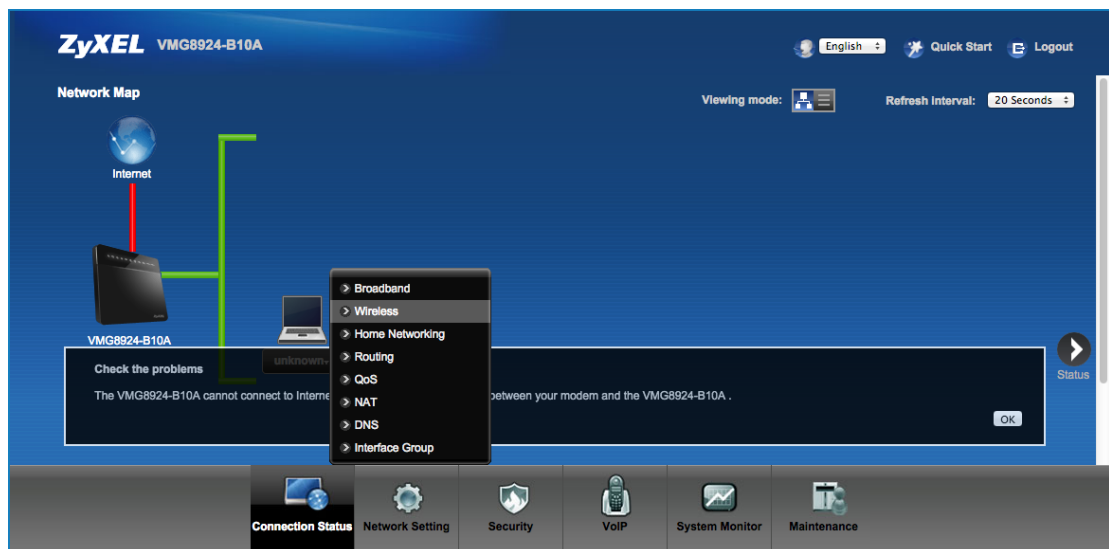
To disable the Router WPS method for VMG8924 series and VMG1312 Series:

Below figures are using VMG8924 as example.

1. Login to the router GUI by typing <http://192.168.1.1> on an Internet browser's address bar.



2. Go to **Network Setting Icon** at the bottom and select **Wireless**.



3. Go to WPS Tab, Select **Disable** to disable the WPS function.

ZyXEL VMG8924-B10A

English Quick Start Logout

General Guest/More AP MAC Authentication **WPS** WMM WDS Channel Status

Wi-Fi Protected Setup (WPS) lets you set up wireless security easily. Select a method for establishing a WPS connection between the router and another WPS-compatible device.

### 2.4GHz WPS Setup

WPS :  Enable  Disabled (The settings in this screen are invalid if you select this.)

Method 1	Method 2	Method 3
<p><b>Push Button Configuration</b></p> <p>1. Click 'Connect'.</p> <p><input type="button" value="Connect"/></p> <p>2. Activate WPS on the wireless client within 2 minutes after clicking "Connect".</p>	<p><b>Register Wireless Client PIN Number</b></p> <p>1. Enter the PIN of your wireless client and click 'Register'.</p> <p><input type="text"/> <input type="button" value="Register"/></p> <p>2. Activate WPS on the wireless client within 2 minutes after clicking "Connect".</p>	<p><b>Enter AP's PIN Number in Wireless Client</b></p> <p>Current state: Configured</p> <p>1. Please release configuration if you want to configure the wireless settings.</p> <p><input type="button" value="Release Configuration"/></p> <p>2. Enter current PIN <b>11099567</b> on your wireless client.</p> <p><input type="button" value="Generate New PIN Number"/></p>

**Notes:**

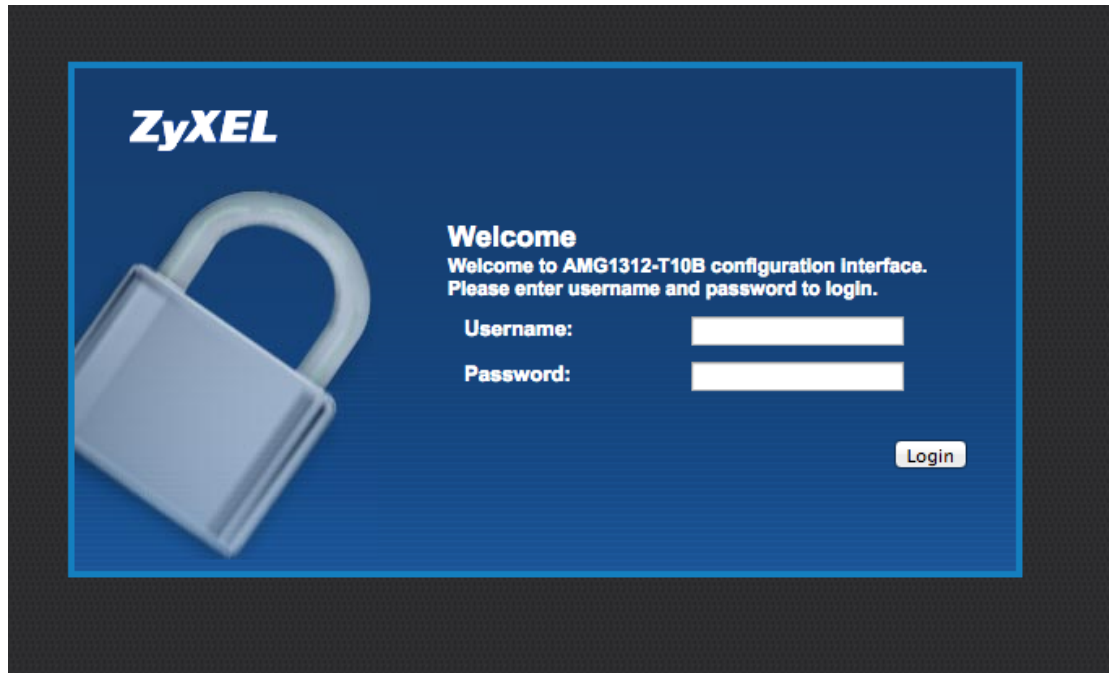
1. The WPS function only works on the first SSID for 2.4 and 5GHz respectively. Guest WLAN's cannot be used with WPS.
2. Click the 'Release Configuration' button to have the WPS status changed to 'Unconfigured'. Otherwise, WPS status is in 'Configured' mode.

4. Hit **Apply** button to save settings.

To disable the Router WPS method for AMG1202, AMG1302 and AMG1312 series:

Below figures are using AMG1312-T10B as example.

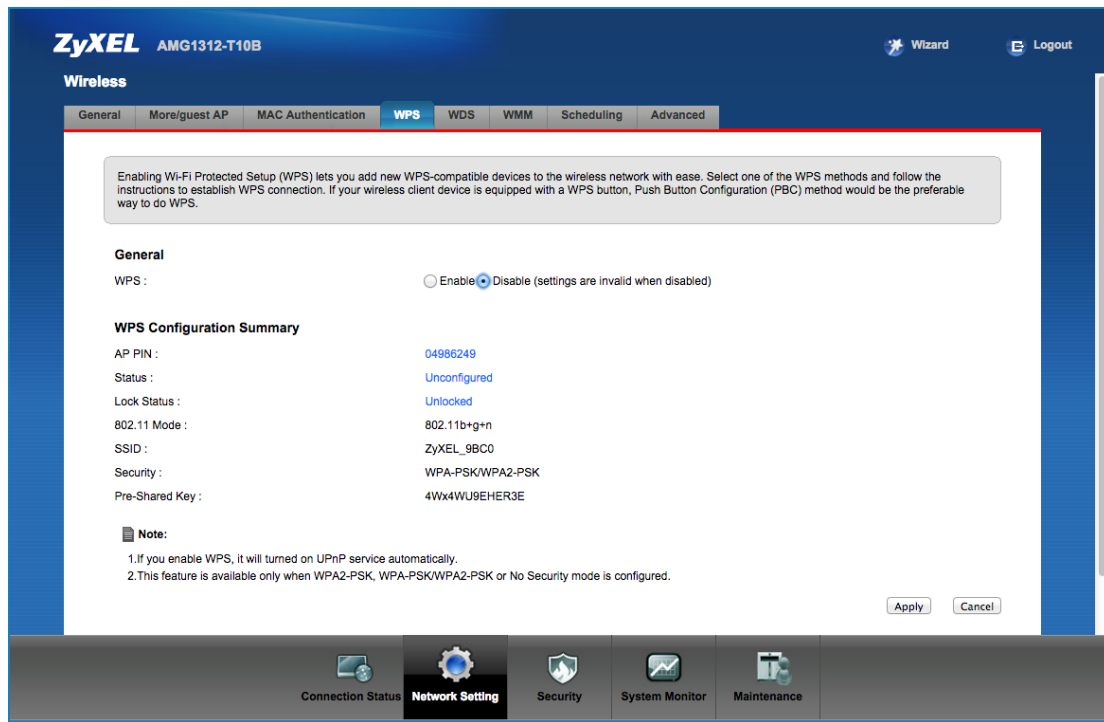
1. Login to the router GUI by typing <http://192.168.1.1> on an Internet browser's address bar.



2. Go to **Network Setting Icon** at the bottom and select **Wireless**.



3. Go to WPS Tab, Select **Disable** to disable the WPS function.



The screenshot shows the ZyXEL wireless configuration interface for device AMG1312-T10B. The 'Wireless' section is active, and the 'WPS' tab is selected. A message explains that enabling WPS allows for easy device addition. Under the 'General' section, the 'WPS' option is set to 'Disable (settings are invalid when disabled)'. Below this, a 'WPS Configuration Summary' table lists: AP PIN (04986249), Status (Unconfigured), Lock Status (Unlocked), 802.11 Mode (802.11b+g+n), SSID (ZyXEL\_9BC0), Security (WPA-PSK/WPA2-PSK), and Pre-Shared Key (4Wx4WU9EHER3E). A 'Note' section contains two instructions: 1. Enabling WPS automatically turns on UPnP. 2. The feature is only available in WPA2-PSK, WPA-PSK/WPA2-PSK, or No Security mode. 'Apply' and 'Cancel' buttons are at the bottom right. A navigation bar at the bottom includes icons for Connection Status, Network Setting (highlighted), Security, System Monitor, and Maintenance.

4. Hit **Apply** button to save settings.

To disable the Router WPS method for NBG Series devices.  
Using NBG419Nv2 as an example:

1. Login to the router GUI (the default password is 1234) by typing <http://192.168.1.1> on an Internet browser's address bar.



2. Click on the **Expert Mode** on the top right of the Webpage.



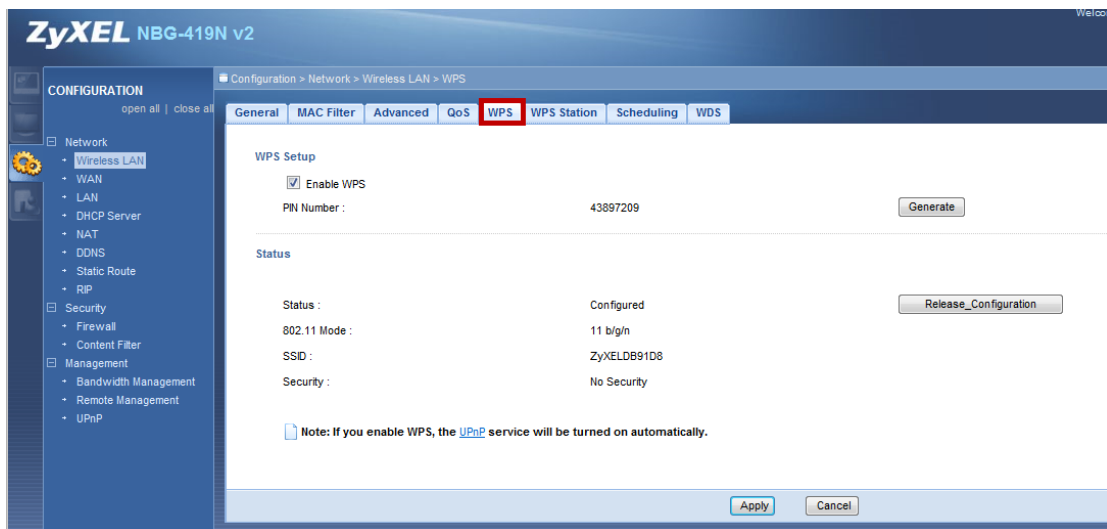
3. Go to **Configuration** menu on the left side of the navigation bar.



The screenshot shows the ZyXEL NBG-419N v2 web interface. The top header displays the device name and version. Below it, the 'Status' section is active. On the left navigation bar, the 'Configuration' menu item, represented by a gear icon, is highlighted with a red box. The main content area shows 'Device Information' with a table of system details.

Item	Data
Host Name:	NBG-419N v2
Firmware Version:	V1.00(AACU.5)C0
System Mode:	Router Mode
WAN Information:	
- MAC Address:	CC:5D:4E:DB:91:D9
- IP Address:	10.59.4.31
- IP Subnet Mask:	255.255.255.0
- Default Gateway:	10.59.4.1
- DHCP:	Client

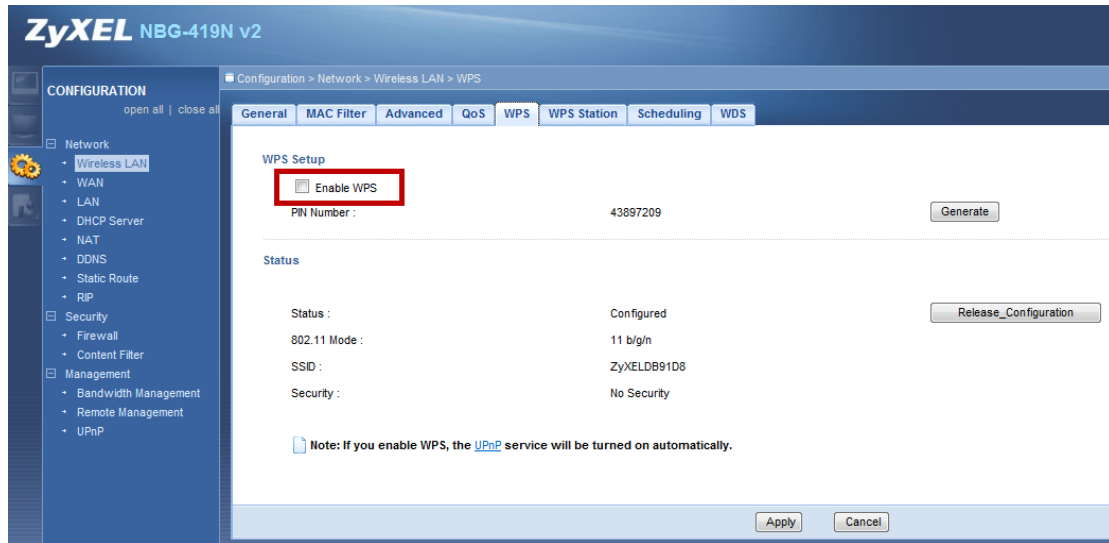
4. Select the **WPS** tab



The screenshot shows the ZyXEL NBG-419N v2 web interface in the configuration mode. The left navigation bar shows the 'CONFIGURATION' menu with 'Wireless LAN' expanded. The 'WPS' tab is selected and highlighted with a red box. The main content area displays the 'WPS Setup' configuration page. The 'Enable WPS' checkbox is checked, and the 'PIN Number' is set to 43897209. The 'Status' section shows 'Status: Configured', '802.11 Mode: 11 b/g/n', 'SSID: ZyXELDB9108', and 'Security: No Security'. A note at the bottom states: 'Note: If you enable WPS, the UPnP service will be turned on automatically.' Buttons for 'Generate', 'Release\_Configuration', 'Apply', and 'Cancel' are visible.



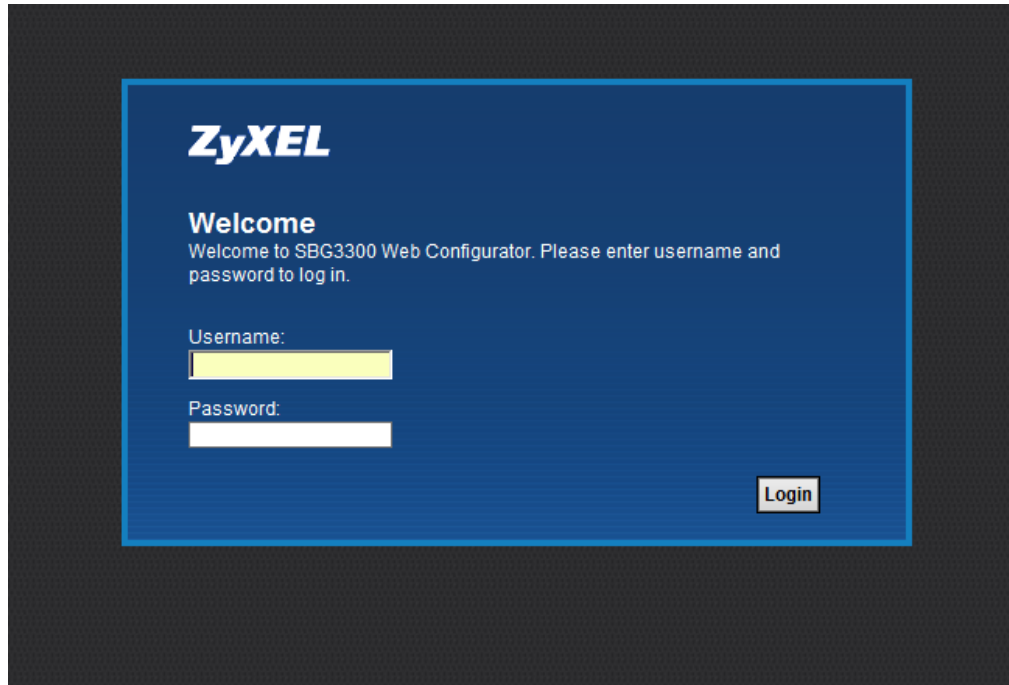
5. Click off the **Enable WPS** check box to disable the WPS function



6. Hit **Apply** button to save settings.

To disable the Router WPS method for SBG3x00 series:

1. Login to the router GUI by typing <http://192.168.1.1> on an Internet browser's address bar.



2. Go to **Network Setting** menu and select **Wireless**.

The image shows the ZyXEL SBG3300 Network Setting - Wireless menu. The left sidebar contains a navigation tree with "Network Setting" selected, and "Wireless" highlighted in red. The main content area is divided into several sections:

- Status**: A summary of system information including Host Name (zyXEL), Model Number (SBG3300), and Firmware Version (Y1.00(A)QW.1L\_01140901G1).
- System Status**: A table showing system up time (0 days: 3 hours: 56 minutes), current date/time (01 Jan 2014 03:57:05), and system resource usage (CPU: 4.03%, Memory: 53%).
- WAN Status**: A table showing the status of various WAN connections.
- IPSec VPN Status**: A table showing the status of IPSec VPN connections.

WAN	Status	LB	IP Address	Connection	Speed (DL/UL)
ADSL	Down	Active		PPPoE	
VDSL	Down	Unknown		PPPoE	
ETH/WAN	Down	Unknown		IPoE	
eth3G	Down	Unknown		Cellular	
ppp3G	Down	Unknown		Cellular	

#	Name	Application Scenario	Remote Gateway Address
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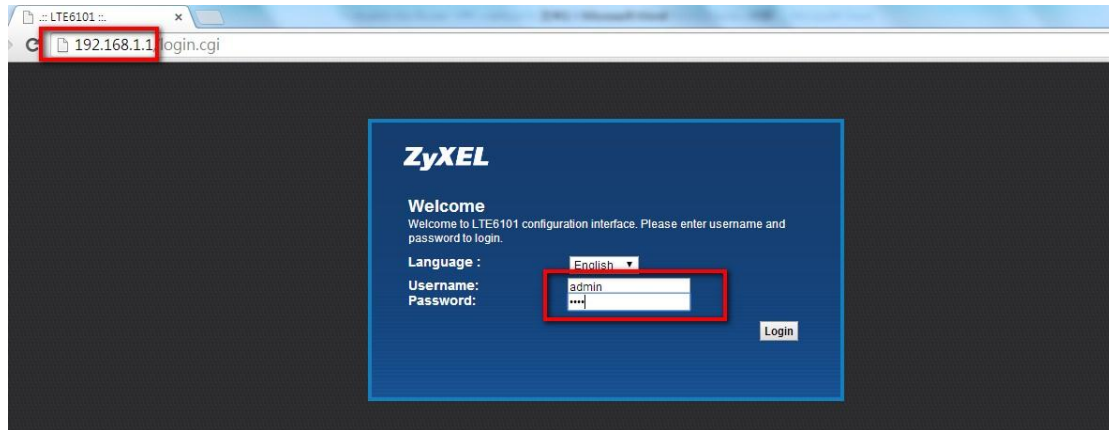
3. Go to WPS Tab, Select **Disable** to disable the WPS function.

The screenshot shows the ZyXEL web management interface for a device (SG3300). The 'Wireless' section is active, and the 'WPS' tab is selected. A red box highlights the 'WPS' tab in the top navigation bar. Below the navigation bar, a message states: 'Click the "Release Configuration" button to have the WPS status changed to "Unconfigured". Otherwise the WPS status will remain in "Configured" mode.' The 'WPS Setup' section has a red box around the 'Disable' radio button, which is selected. The 'Enable' radio button is unselected. Below this, three methods are listed: Method 1 (Push Button Configuration), Method 2 (Register Wireless Client's PIN Number), and Method 3 (Enter AP's PIN Number in Wireless Client). At the bottom right, there are 'Apply' and 'Cancel' buttons.

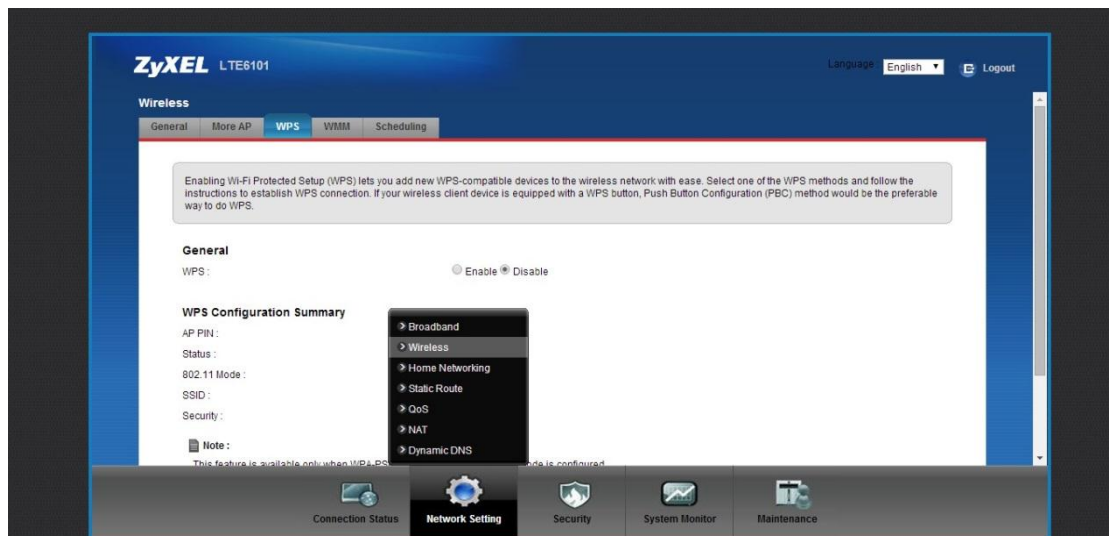
4. Hit **Apply** button to save settings.

## LTE6101: What is the procedure to check whether WPS is disabled?

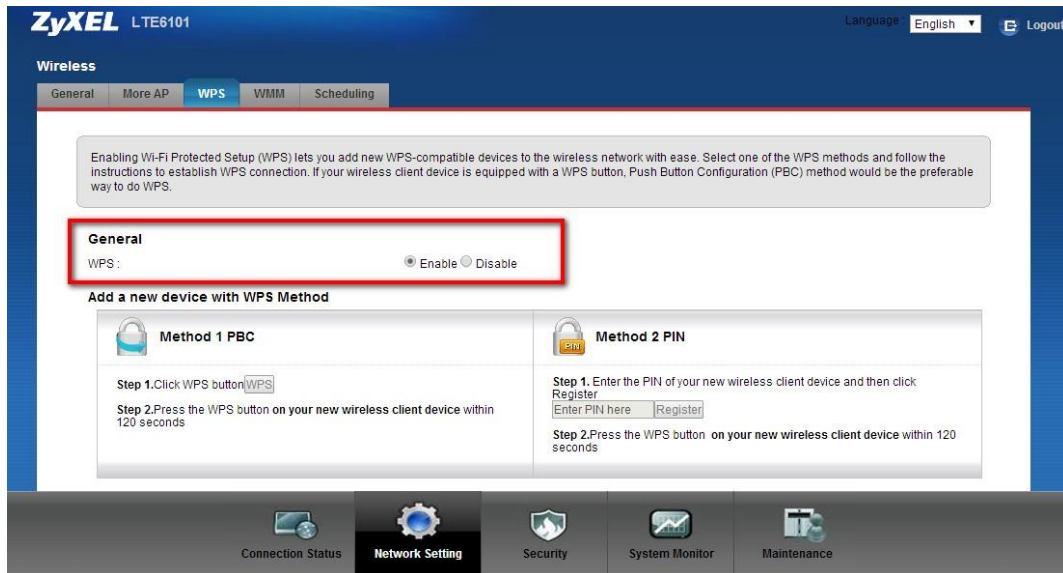
1. Login to the web GUI of the device by entering 192.168.1.1 in an Internet browser. The username is “admin” and the password is “1234”.



2. Go to Network Setting, Wireless, WPS.



3. In WPS configuration page, please check whether the function is disabled. If it is enabled, please do step 4. The below image shows the “Enable” configuration.



4. To disable the function, please click on “Disable” and click on “Apply”, as shown in the image below.

