

Hands-On Wireless LAN Installation Guide



S.Y. Wong CEng MIEE

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Special points of interest

- 11/54Mbps High Speed Wireless LAN Product Overview
- Hands-On installation Guide for Novice
- The Choice of Hot Spot and Coverage Tips
- Broadband Internet Sharing – Multi-users on a single ISP Subscription
- A step-by-step illustration with lots of diagrams and pictures

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Building your 11/54Mbps High-Speed Home/Office wireless network with a step-by-step approach – You can do it too! And it's fun!

Spending a weekend afternoon unwiring your notebooks and desktop PCs is fun and rewarding. Not only will you be able to remove clusters of wires hovering on corridors with dust, you can get them connected for web surfing and network games over the air.

The following paragraphs are going to show you how to build a high speed wireless network using the 11g gears at home or office. Although there are many brands of Wireless LAN kits in the market, they are different in many ways. In addition to features and user friendliness, of probably significant to you are the radio sensitivities in choosing these gadgets because not only does it separate the stars from dogs, it can also affect the overall throughput performance of your wireless LAN.

Watch out for those access points that offer a single antenna or a pair of small and non-detachable antennae, these are the areas that the “smart” manufacturers are shedding their costs. Fine if you have a small working area, otherwise you may have to spend more for extra access points or additional pricy antenna to make satisfactory radio coverage.

After-sales support is equally important because a router is not something that you'd expect to plug and play in a min-



A popular Wireless LAN Kit to unwire a notebook and a desktop PC for the freedom of broadband Internet Sharing

utes, you may need to get over some huddles of settings to the router and PC clients before you can enjoy the benefits they bring. Most shops will probably forget you the minute you walk out of their doors and they'll point you to the distributor when something goes wrong. Enough said. Get ready, unroll your sleeves and let's do it.

Elements of a Wireless LAN

In this example we are going to choose the most popular setup that consists of a desktop PC, a notebook and a broadband Internet access modem. At the end of the setup, these computers will be able to form a wireless LAN and share the broadband Internet access with each other.

To build the wireless network, you will need a WX-6615 access point router, a WL-660 PCI card for the desktop com-

puter and a WL-611 PCMCIA card for the notebook. Both computers are running on Windows XP.

Assembling the SparkLAN Wireless Access Point Router

Having unpacked the WX-6615 kit, you will find the wireless access point router, two antennae, an 110~220V A/C adaptor, an installation CDROM, two wall mounting screws and a cross-over RJ45 Ethernet cable.

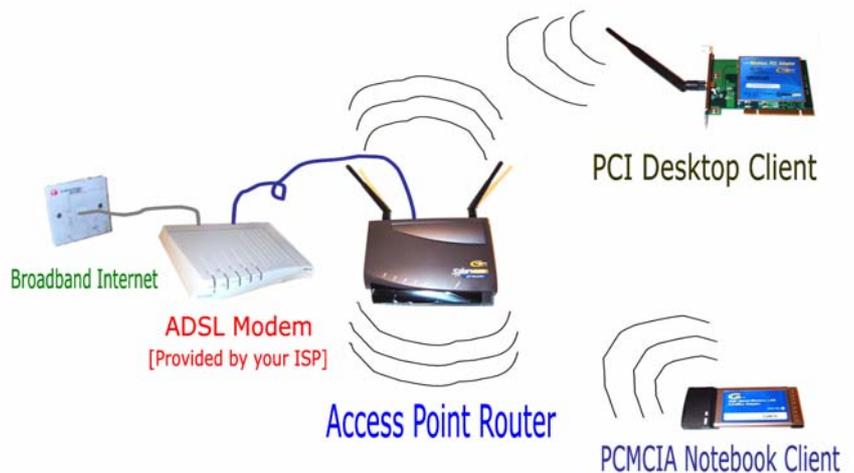


Unpacking the SparkLAN WX-6615 G 11/54Mbps High Speed Access Point Router Kit

Assemble the antennae by turning gently at the back of the access point, plug in the 5V DC jack before switching on the A/C power supply. The access point is now running at factor defaults. This is just what you need at this stage to establish the radio link with the notebook to make some signal coverage tests before we come back to complete router configuration. Why setup the notebook first? Because you can walk it to anywhere you need radio coverage.

Installing the Wireless LAN Card to the Notebook Computer

Next, unpack the WL-611 PCMCIA Card and insert it into the notebook's PCMCIA slot. Power up the notebook and windows before loading up the SparkLAN wireless LAN Version 1.3.1 configuration CDROM. A new window will pop up showing the SparkLAN utilities and configuration programs. Now select the top button "Install Config Utilities". When the next screen appears, hit the button at the left-



Network Configuration of a Wireless LAN for Broadband Internet Sharing between the PC Clients

hand bottom "WL-611/WL-660" 11g Wireless LAN Card, and follow the steps of the installation utility. You may also refer to the SparkLAN installation guide for Windows 98/ME/2000/XP operating systems. When you have completed the setup successfully, reboot the notebook.



Twist the dual detachable antennae on to the AP Router. Each antenna has a 2dBi RF signal sensitivity gain



STEP 1- Double click the "Install Config Utilities" button



Assembling the dual detachable antennae. Each antenna has 2dBi gain



STEP 2 - Double click the "WL-611/WL-660" button to install the Wireless Monitor at the Notebook Computer

After reboot, open the Wireless Monitor. You will find the icon at



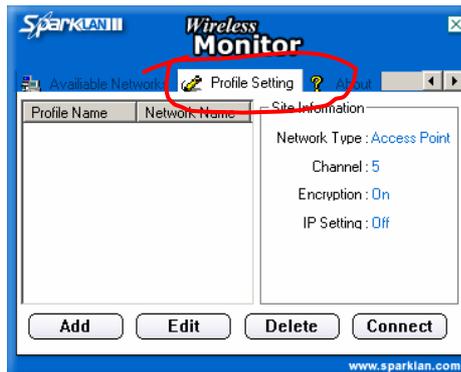
The Wireless Monitor icon appears at the right-hand bottom after installation

the right hand bottom of the Windows bar, or at Start-> Programs-> Wireless Network. It is a good practice to put the Wireless Monitor shortcut at the Windows Desktop, as this may prove to be extremely handy when you need to access the wireless link information, or to manage the profile settings.

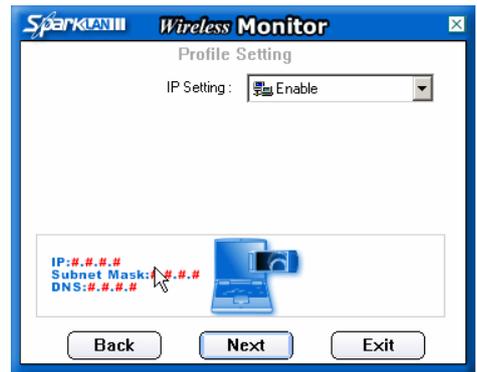
Personalizing the Wireless Profile on the Notebook

When the SparkLAN Wireless Monitor pops up, click on "Profile Settings" and hit the "Add" button to add a new profile. Now enter the Profile Name. Probably you may like to use a name related to the location of your wireless network, such as "peter-home" or "peter-office". You may add more profiles so that you can switch to the corresponding profile at home, office, airport, McDonald's and so on. At the next screen, enter the factory default Network Name as "sparklan-g", Network Type as "Access Point", Transfer Rate as 54Mbps (11G). Next, leave the Encryption as "off" at the moment. Next, IP Setting as "Enable". Next, DHCP as "Disable" and now, populate the data as follows:-

- IP Address : 192.168.1.100
- Subnet Mask : 255.255.255.0
- Default Gateway : 192.168.1.1
- DNS Server : 205.252.144.126



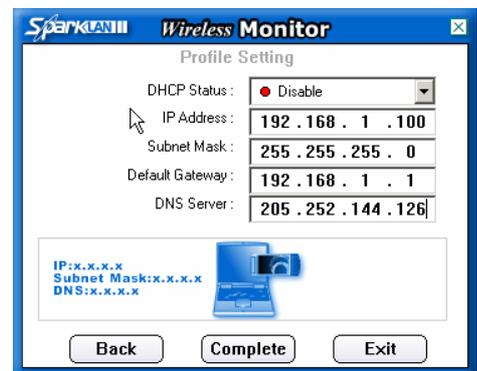
STEP 1 - Double click the Wireless Monitor icon and go to "Profile Setting", then click the "Add" button



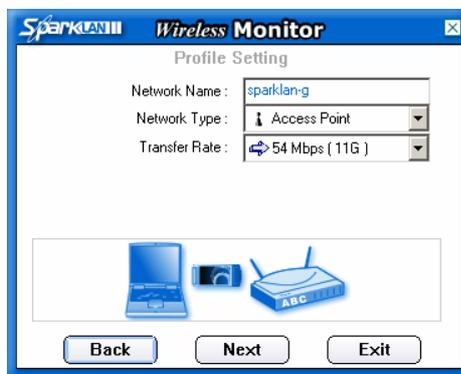
STEP 5 - Enable the IP Setting, then click "Next"



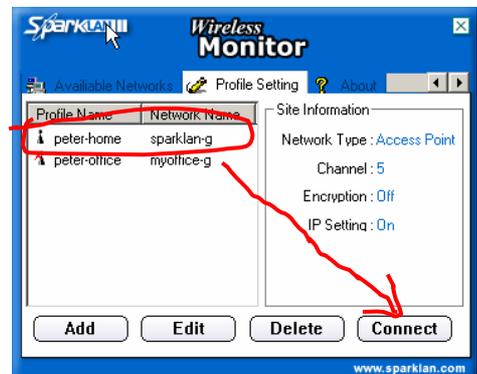
STEP 2 - Enter "peter-home" as your Profile Name for the notebook client, then click "Next"



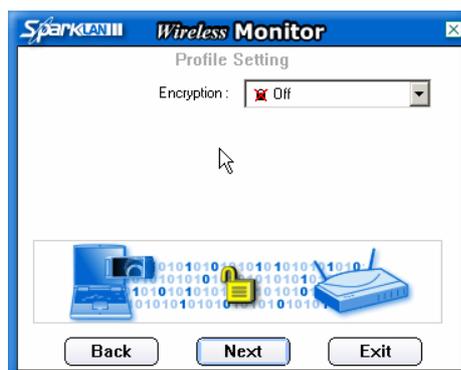
STEP 6 - Disable the DHCP Status and populate the data as shown here, double check your entries then click "Complete"



STEP 3 - Enter "sparklan-g" as the Network Name, then click "Next"



STEP 7 - This gives you a new profile "peter-home". You may add another profile such as "peter-office" for your office WLAN.



STEP 4 - Leave the Encryption as "Off" for the moment, then click "Next"

Hit "Complete" to return to the Wireless Monitor and then "Connect".

Now go to the "Link Information" and choose Current Profile setting as the Profile Name that you've just setup. Hit the "More..." button and you'll be able to see the signal bar and the link quality bar. Ah, forgot to tell you...stay close to the access point router when you make the notebook settings. I am sure you did, otherwise you might

have missed the radio signal. Now get ready to pick the best spot to optimize the coverage and traffic performance.

Choosing a Spot for the Access Point Router

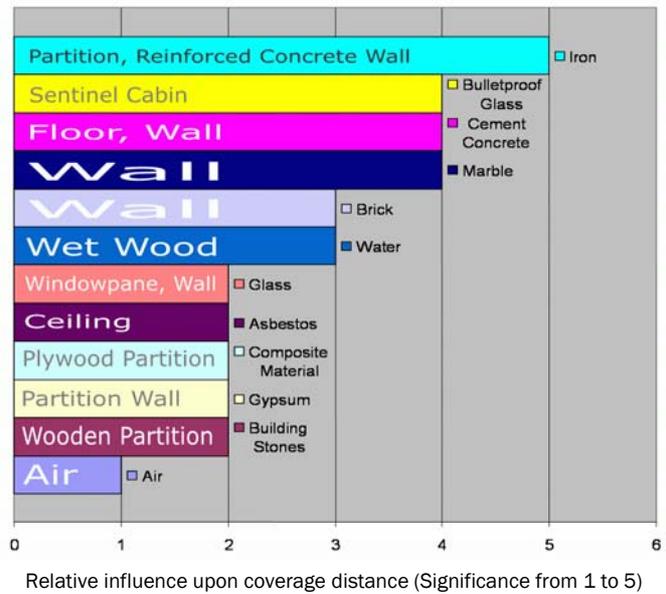
The next task is to determine the location of the access point. Usually, the choice is confined by the need of sticking close to your broadband modem. If the broadband modem is located at the centre of the coverage area, that's fine. Otherwise, you might have to run some field tests to see if there is a need to find a better spot for the modem and access point. In some situations where you might need more than one access point, the rule of thumb is to populate the access points adequately where there are high concentrations of users, rather than distributing the access point evenly in the room.

If the site has many rooms and partitions, you've got to take them into the coverage equation. You may not want to choose a spot at a corner where it is separated from the rest of the coverage area by many large cement concrete walls, nor do you want to put your access point on top of an iron cabinet – as these could attenuate the radio signal significantly and lower your effective coverage radius.

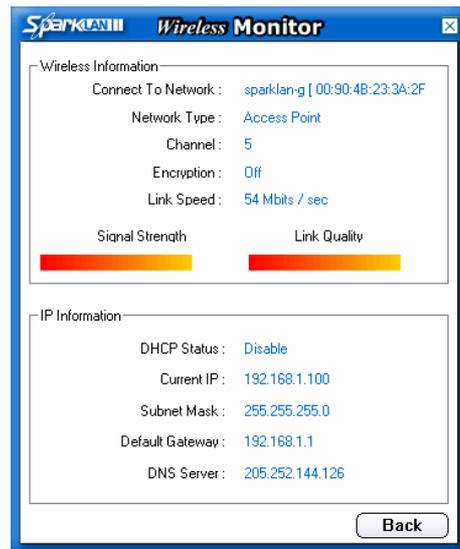
Running the Radio Coverage Test

Having chosen your spot(s), you shall run the coverage test. Double click the Wireless Monitor icon at your notebook computer and hit "Link Information". This is going to give you're a radio link between your notebook and the access point. SparkLAN provides a pretty good signal strength and link quality visuals, indicating the percentage of coverage and signal bars. Not only this, you can also detect foreign access points in your vicinity.

Once you get this active signal quality screen on your notebook, we suggest you to walk away from the access point with your notebook and check the signal qual-



Click on "Link Information" at the Wireless Monitor, select "peter-home", then click "More..."



The "Link Speed", "Signal Strength" and "Link Quality" are going to change as you move around the coverage area



Bench mount— putting the AP Router side-by-side with the ADSL modem.



Wall mount at a wooden shelf—this gives your AP Router an elevated visibility



Unpacking the SparkLAN WL-660 PCI Card for the desktop computer

ity at the spots where you'd spend most of the time at work. Adjust the location of

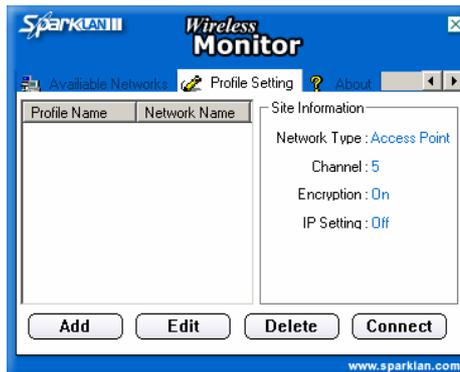
your access point to optimize the coverage. In case you've got a large coverage area with too many blind spots, you may consider refocusing your coverage or expanding it by adding more access points.

Personalizing the Wireless Profile on the Desktop Computer

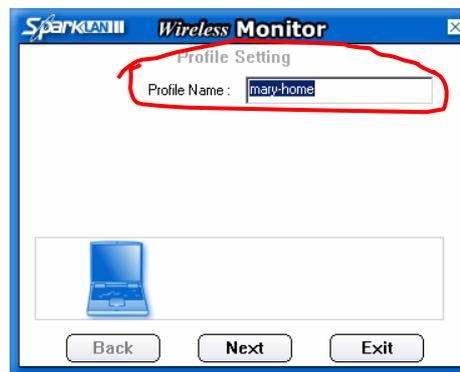
After the coverage test is completed, you are ready to install the PCI card for your desktop computer. Unplug the power cord from your computer, and unscrew the cabinet. Choose an empty PCI slot and insert the SparkLAN WL-660 PCI card carefully into it. Fix the screw on top of the card and replace the cabinet with A/C power supply. Boot up Windows and insert the SparkLAN wireless LAN version 1.3.1 configuration CDROM. A new window will pop up showing the SparkLAN utilities and configuration programs. Now select the top button "Install Config Utilities". When the next screen appears, hit the button at the left-hand bottom "WL-611/WL-660" 11g Wireless LAN Card, and follow the steps of the installation utility. You may also refer to the SparkLAN installation guide for Windows 98/ME/2000/XP operating systems. When you have completed the setup successfully, reboot the notebook.

When the SparkLAN Wireless Monitor pops up, click on "Profile Settings" and hit the "Add" button to add a new profile. Now enter the Profile Name. Choose a name different from your notebook computer. At the next screen, enter the factory default Network Name as "sparklan-g", Network Type as "Access Point", Transfer Rate as 54Mbps (11G). Next, leave the Encryption as "off". Next, IP Setting as "Enable". Next, DHCP as "Disable" and now, populate the data as follows:-

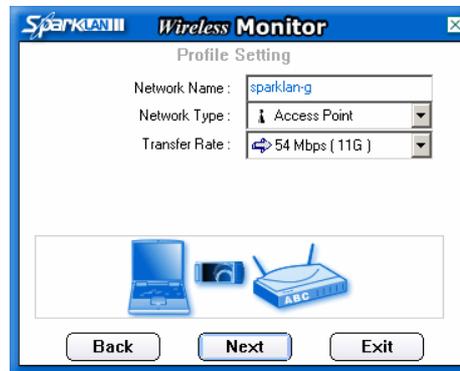
- IP Address : 192.168.1.101
- Subnet Mask : 255.255.255.0
- Default Gateway : 192.168.1.1
- DNS Server : 205.252.144.126



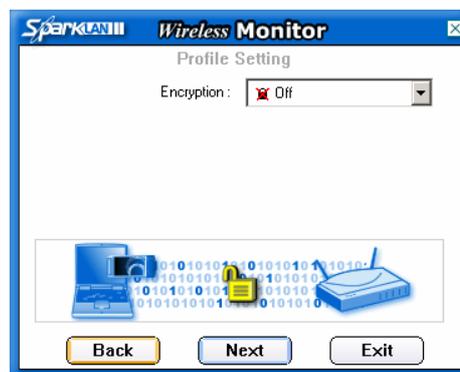
STEP 1 - Double click the Wireless Monitor icon and go to "Profile Setting", then click the "Add" button



STEP 2 - Enter "mary-home" as your Profile Name for the desktop PC client, then click "Next"



STEP 3 - Enter "sparklan-g" as the Network Name, then click "Next"



STEP 4 - Leave the Encryption as "Off" for the moment, then click "Next"



Unscrew the side panel of the PC



Pull out the side panel gently and find an empty PCI slot at the motherboard



Insert the WL-660 PCI card and fasten it with the screw



Twist on the antenna at the back of the WL-660 PCI card carefully



Replace the side panel and adjust the position of the antenna to get the best signal reception.

You may notice that we use 192.168.1.101 for this desktop and 192.168.1.100 for the notebook. This is to tell access point router where to direct the IP packets for broadband Internet sharing simultaneously.

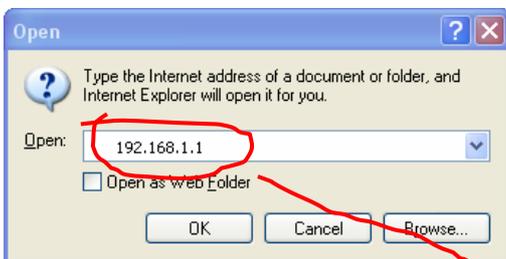
Hit "Complete" to return to the Wireless Monitor and then "Connect". Now go to the "Link Information" and choose Current Profile setting as the Profile Name that you've just setup. Hit the "More..." button and again you'll be able to see the signal bar and the link quality bar.

What if You Need to Add More PC in the Future?

If you plan to add more computers for wireless broadband sharing in the future, you may assign their IP addresses as 192.168.1.102, 192.168.1.103, ..., and so on.

Finishing up the Settings of the Access Point Router

Coming back to the settings of the Access Point Router, double click your web browser, press "Ctrl-L" together and key in the address 192.168.1.1, this is going to bring you to the "Login" of the Access Point Router. At default, skip the Username and key in "admin" at the Password box. Hit "Enter" to the SETUP page.



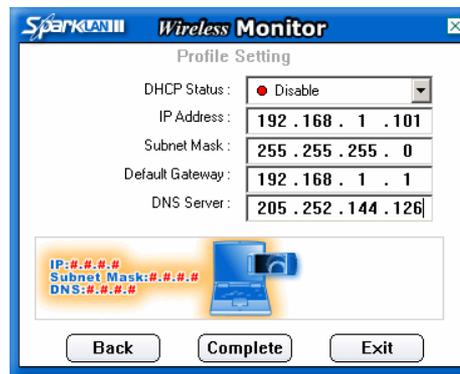
To access the system administrator of the AP Router, open your Internet Explorer, press "Control-L" keys together and key in "192.168.1.1", then press OK

Setting the Time Zone

At the SETUP page, choose (GMT +8:00) China, Hong Kong, Australia Western.



STEP 5 - Enable the IP Setting, then click "Next"



STEP 6 - Disable the DHCP Status and populate the data as shown here, double check your entries then click "Complete". Note that we use 192.168.1.101 this time.



STEP 7 - This gives you a new profile "mary-home". You may add another profile such as "mary-office" for your office WLAN. Now, highlight the "mary-home" profile and click "Connect"



When this screen pops up, skip the User name and leave it blank, enter "admin" as the Password, then press OK

Watch out for those access points that offer a single antenna or a pair of small and non-detachable antennae, these are the areas that the "smart" manufacturers are shedding their costs.

More on Page 1...

Click "Apply" then "Continue".



Setting the clock to "China, Hong Kong, Australia Western"

Setting the Broadband Internet to Your Internet Services Provider

For PCCW-IMS, HKNet, iCare, Pacific Supernet, So-net and Oxygen ADSL modem dem:-

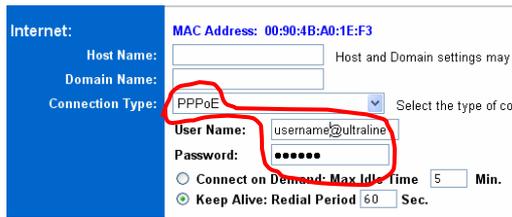
At the SETUP page, choose "PPPoE" as the Connection Type. The Username and Password boxes will appear just underneath the Connection Type. Enter the exact Username and Password provided by your Internet Services Provider. Click "Apply" then "Continue".

At the STATUS page, you will be able to see "Connected" with the IP and DNS addresses assigned by your Internet Service Provider if the broadband access is connected successfully.

Setting up the Wireless Options at the Access Point Router

Keep the Mode to "G-Only" if you have only got 11g PC wireless clients, otherwise choose "Mixed" if you get both 11b and 11g working devices. Leave "FCC" as the Domain in Hong Kong. Pick a channel that is not being used by anybody else in your vicinity.

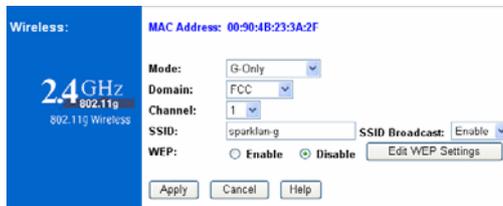
How do you know? You may go the Wireless Monitor and see the channel number(s) occupied by the wireless network(s) detected by the Access Point



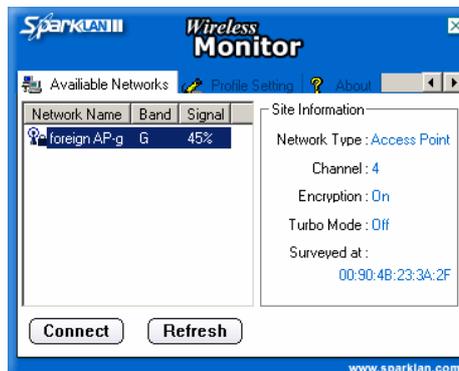
For ADSL modem connection, choose "PPPoE" as the Connection Type, enter your User Name and Password provided by your ISP



The "Status" screen refreshes every six seconds. It shows a bunch of IP and DNS addresses if the AP router is connected to your ISP



The default SSID is "sparklan-g" and the WEP is off. You will need to change it to a different name and turn on the WEP that we are going to show you in the next couple of steps



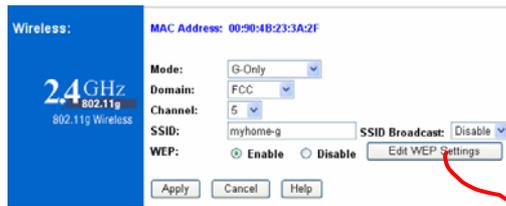
To avoid using the same channel as other WLAN in your vicinity, click on "Available Networks" at the Wireless Monitor. In this example, channel 4 is already occupied by "foreign AP-g", so you should use something else

If the site has many rooms and partitions, you've got to take them into the coverage equation. You may not want to choose a spot at a corner where it is separated from the rest of the coverage area by many large cement concrete walls, nor do you want to put your access point on top of an iron cabinet.

More on Page 4...

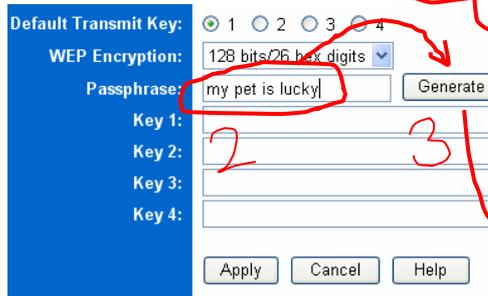
Router.

At default, the SSID "sparklan-g" is generic name. We suggest you to change it to something else (let's say we change the SSID to "myhome-g" in this example) and disable the SSID Broadcast, so that foreign wireless PC clients shall not be able to read your SSID.



Here we choose channel 5 but in your situation you have to choose a different one if 5 is already occupied by somebody else. Set the SSID as "myhome-g", turn off SSID broadcast and enable the WEP, then click "Apply"

It is strongly suggested to enable the WEP encryption. Click "Edit WEP Settings" and choose 64 bits or 128 bits encryption according to your preference. "Passphrase" is a phrase that will generate the keys. For example, "my pet is lucky" will generate Key1, Key2, Key3 and Key 4 as "E7EA863197696D8B5B84FE9C66" and you should keep it safely after enabling each of your wireless PC clients with these keys.

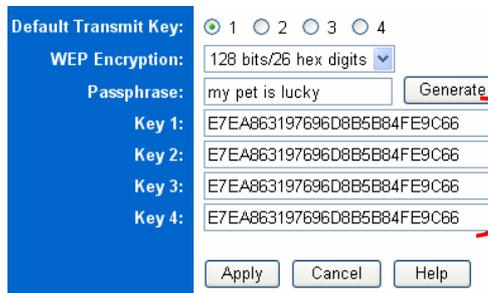


Build the WEP Encryption with a Passphrase such as "my pet is lucky", then click "Generate" and "Apply"

It is strongly suggested to enable the WEP encryption. Click "Edit WEP Settings" and choose 64 bits or 128 bits encryption according to your preference.

Modifying the Wireless Options at the PC Clients

If you change the SSID and WEP Encryption Keys at the Access Point Router, modify them also at each of your wireless PC clients.



The keys are generated automatically. Write down these keys carefully and we shall use it later for the wireless client PC setting, then click "Apply"

To do so, double click the Wireless Monitor, click on "Profile Settings", highlight the Profile Name and hit the "Edit" button to change the settings. Click "Next". Change the factory default Network Name as "myhome-g", keep the Network Type as "Access Point" and the Transfer Rate as 54Mbps (11G). Click "Next". Change the Encryption as "64 bits" or "128bits" depending on your corresponding setting at the Access Point Router. Click "Next". Enter the Input Method as "Hexadecimal (0-9, A-F)"; the Key as "E7EA863197696D8B5B84FE9C66"; the Key Index as "(1)". You may continue to enter Key2, Key3 and Key4 if they are different, otherwise Click "Next" two times to keep the existing DHCP setting, and finally click "Finish".



STEP 1 - Double click the Wireless Monitor icon on your desktop PC and go to "Profile Setting", then double click the "my-home" profile button. Please note that you have to repeat the following steps for your notebook wireless client as well.

A Final Word

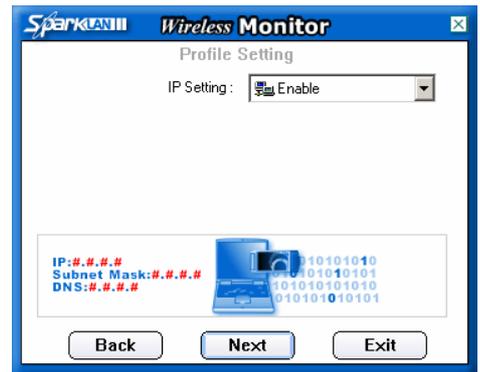
At this stage, the WX-6615 Access Point Router is ready for Broadband Internet sharing and LAN functionalities. You should be able to access the web sites from your notebook and PC simultaneously. If not, you might probably need to reboot your machine to put new settings in action. Or, go back to the previous pages and check the steps carefully if there are any wrong entries or typo mistakes. "Caps Lock" is also common symptom that cheats your typing into capital letters. Beware to turn it off when it isn't.

You might also have noticed that we disabled the DHCP from the Access Point Router. DHCP is an advanced function that assigns the internal IP addresses to the PCs when they are connected to the wireless LAN. It saves the hassles of assigning the IP addresses manually such as 192.168.1.100 and 192.168.1.101 like what we did. But why didn't we just simply turn it on? For two reasons. First, to show you the IP setting without DHCP. Second, you will need to disable DHCP when you need more advanced services such as port forwarding for FTP, Telnet, SMTP, DNS, TFTP, SNMP, etc., especially when the number of wireless PCs grow in future.

The other thing that's worth doing is documentation. Make a form for yourself to record and update the Broadband Access Username and Password, the IP/ DNS settings and



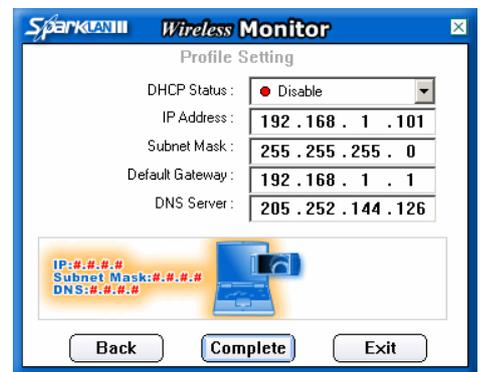
STEP 2 - then click "Next"



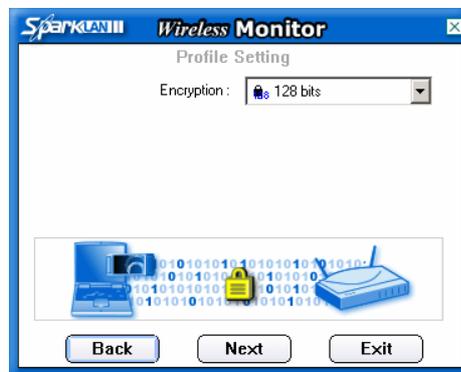
STEP 6 - Keep the IP Setting as "Enable", then click "Next"



STEP 3 - Change the Network Name as "myhome-g", then click "Next"



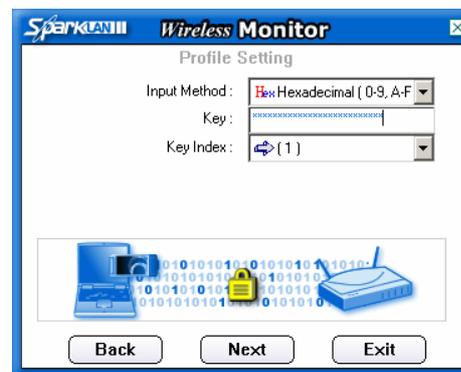
STEP 7 - Keep the DHCP as "Disable" and the data as above, then click "Complete".



STEP 4 - Set the Encryption as "128 bits"



STEP 8 - Now, highlight the "mary-home" profile and click "Connect"



STEP 5 - Choose Hexadecimal (0-9,A-F), enter the key you wrote down earlier. Note that all "0" are zeros—not the letter "O". You need only to enter one key if all keys are the same, then click "Next"

encryption keys of all your PC clients. Keep it in a safe place. You'll treasure your effort again and again when such handy information is in need. **d**

danets

S.Y. Wong CEng MIEE

DataCom Network Ltd.
1505 Ricky Centre
Kwun Tong
Hong Kong

Phone: +852 2951 0321
Fax: +852 3141 9209
Email: marcom@danets.com



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Building your 11/54Mbps High-Speed Home/Office wireless network with a step-by-step approach- You can do it too! And it's fun!

- There are various 802.11x wireless products available in the market, how to choose the one that serves your needs?
- After reading the manuals I am still getting to nowhere. Is there a place to start and keep things simple?
- Where shall I install the wireless LAN? Wall or floor?
- How do I know that I've got optimal radio signal coverage in my working area? What if I don't?
- What do I turn on the wireless data encryption?
- How do I make the IP settings without DHCP?

...find out the answers in this guide.

