

NM6000 WLAN Client



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# NM6000 User's guide v1.2

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# **1 INSTALLATION**

### 1.1 Points to Remember Before Installation

- The NM6000 WLAN Client is an embedded wireless network module, not a general-purpose wireless LAN device. Our module does not support the RJ-45 connector that is normally used in a typical wired LAN installation. Thus, to access the utility web server that is integrated in the NM6000 module and that walks you through the setup procedures, you need a wireless network (WLAN).
- Using a wireless LAN client, you can control the NM6000 module. To access the utility web server that is integrated in the NM6000 module, a separate access point is required.
- The NM6000 module does not come with a separate electrical jack. The electrical power must be supplied through the interface connector for NM6000 from an internal source where the NM6000 module is installed.

### 1.2 Accessing the NM6000 Module

As mentioned previously, when a RJ-45 connector is not added, to change the settings of the NM6000, you need a separate wireless client (station) to gain access to the NM6000 and then you need to get into the utility web server from the web browser of the wireless terminal.

% You can change the setting of the NM6000 using NM6000-IF board with crossed UTP cable

#### A. Wireless Client(Station) Setting

The wireless default settings of CW-1130MU0 are given below. You need to configure the settings of the wireless client (terminal) for your access as follows:

- SSID: NM6000
- Network Mode: Ad-Hoc (peer to peer)
- WEP: **disabled** (not used)
- Authentication Mode: Open System
- \* For the Wireless LAN Adapter settings, please refer to the manual for the Wireless LAN Adapter.
- \* SSID is sometimes called 'network name' depending on the type of an access

point used. SSID is case sensitive (i.e., please pay attention to upper and lower case letters when entering the ID number).

\* Cancel all security options, including WEP.

#### B. Wireless Client (Station) IP Setting

The IP default settings of the NM6000 are given below:

- IP address: 192.168.11.30
- Subnet mask: 255.255.255.0
- Gateway: 192.168.11.1
- ID : admin
- Password : admin

The PC IP settings must be the same as the network ID of the NM6000 module. To configure the network as previously shown (i.e., the access point is directly connected to the PC one to one), the PC IP setting should be done as follows:

인터넷 프로토콜 (TCP/IP) 등록 정보 ? X 일반	Enter the IP address as shown on the left.
네트워크가 IP 자동 설정 기능을 지원하면 IP 설정미 자동으로 합당되도록 할 수 있습니다. 그렇지 않으면, 네트워크 관리자에게 적절한 IP 설정 값을 문의해야 합니다.	IP address can be any one of from 192.168.11.1
○ 자동으로 IP 주소 받기(①) ○ 다음 IP 주소 사용(S):	to 192.168.11.254.
IP 주소(): 192,168,11,31 서브릿 마스크(U): 255,255,255,0	But, it cannot be 192.168.11.30
이 자동으로 DNS 서비 주소 받기(원)	Set the subnet mask to 255.255.255.0.
○ 나을 DNS 서비 수소 사용(E): 기본 설정 DNS 서비(P): 보조 DNS 서비(A):	Gateway and DNS server addresses do not have
	to be specified.
 확인 취소	

#### C. Accessing the NM6000 Module using a Web Browser

After clicking button located at the left bottom corner of the Windows screen, click the 'Run' menu to open the following page. Then, enter 'http://192.168.11.30' and click the 'Ok' button.

<u>? ×</u>
열려는 프로그램, 폴더, 문서, 또는 인터넷 리소스 이름을 입력하십 시오.
http://192,168,11,30
확인 취소 찾마보기( <u>B</u> )

When all settings, the network configuration and the IP address included, are properly set, the Information page is displayed (please refer to the **2.1 Information Page** section in this User's Guide).

#### D. Initial settings

After the initial setup done, the NM6000 can be managed with any Desktop PC or Wireless station which can communicate with it through TCP/IP.

The following section (2 CONFIGURING SETTINGS of the User's Guide) explains further setup procedures for the NM6000 module.

# 2 CONFIGURATION SETUP

The WIZNET NM6000 WLAN Client has an integrated utility web server that walks you through the setup procedures

To gain access to the NM6000 module using the Internet browser, you need to type in the IP address of the NM6000 module in the address field (URL field) of the web browser and hit 'Enter'. The PC IP address and the IP address of the NM6000 module must be identical to the network ID.

- \* The default address of the NM6000 module is 192.168.11.30 and the subnet mask is 255.255.255.0. To make the PC IP address identical to the network ID, the subnet mask needs to be set to 255.255.255.0, and the PC IP address can be any one from between 192.168.11.1 and 192.168.11.254. You cannot use 192.168.11.30, which is the address the NM6000 module uses.
- \* For information on the access procedure, please refer to the '1 INSTALLING' section of this User's Guide.

# 2.1 Information Page

Once linked with the NM6000 module through a web browser, the following Information page pops up. On this page, you can verify important basic information about the module. You can open the same Information page by clicking 'Info' in the upper menu bar.

KRYPTO	DNITE	EEE 802,11b 11Mt Info ) Wireless   IP	ops Wireles Addr   Stat	s LAN tions   Admin		
1	nformat	tion	Informat You ma see the	tion about the y have to re-le current settir	e bridge. oad this igs.	NOTE: page to
SSID Channel BSSID Tx Rate (Mbps) Signal quality (%) WLAN MAC address IP address System firmware version WLAN Primary firmware WLAN Secondary firmware		topaz 1 000DF0 11 100 000270 192.168 1.0.A.0. 1.1.1 1.8.0	topaz 1 000DF0106133 11 100 000270700006 192.168.11.30 1.0.A.0.215 1.1.1 1.8.0			
		Results of the	most rece	nt scan		
	SSID	MAC address	Channel	Signal strength (%)	Mode	
	topaz	000DF0106133	1	100	AP	
	kryptonite1	000270210188	6	83	AP	

- SSID: This is the ID (identifier) of the currently linked wireless network.
- **Channel:** This displays the wireless frequency channel used by the currently linked wireless network.
- **BSSID**: This is the individual cell identifier of the currently linked wireless network. When connected to an access point (AP), this is the physical address (or, MAC address) of the AP.
- **Tx Rate:** This represents the current data transmission speed (11, 5.5, 2, or 1 Mbps).
- Signal quality: The strength of the receiving signal (expressed in %) from the wireless network is shown here. A higher value means a better signal reception.
- WLAN MAC address: This field shows the wireless MAC address (or, physical address) of the NM6000 module.
- System firmware version: This is the firmware version of the NM6000 module.
- WLAN Primary firmware: This is the primary firmware version of the wireless module.
- WLAN Secondary firmware: This is the secondary firmware version of the wireless module.
- **Results of most recent scan:** This section shows a list of available networks, based on the most recent scan.

SSID	MAC address	Channel	Signal strength (%)	Mode
topaz	000DF0106133	1	100	AP
kryptonite1	000270210188	1	71	AP
wlandemo	000270250451	6	55	AP

\* The following explains the above listing in more detail.

- SSID: Wireless network SSID
- BSSID: Wireless network BSSID.
- Channel: Channel being used by the wireless network
- Signal strength: Strength of signals coming from the wireless network
- Mode: Indicates whether or not the network mode and WEP are being used. The network mode is either AP or Ad-Hoc. If WEP is being used, there is a comma (,) after the network mode and then WEP is shown.
  - . AP: Infrastructure Mode
  - . Ad-Hoc: Ad-Hoc Mode
- \* When the network mode is in the Infrastructure mode and using WEP, AP, WEP

is displayed.

# 2.2 Wireless Configuration Page

You can open the Wireless Configuration page by clicking 'Wireless' in the upper menu bar. On this page, you can configure the wireless network settings.

KRYPTONITE	IEEE 802,11b 11Mbps Wireless LAN Info (Wireless) IP Addr   Stations   Admin
Wireless Configuration	On this page you can configure the 802.11b wireless settings. Any new settings will not take effect until the bridge is rebooted. NOTE: You may have to re-load this page to see the current settings
Network Mode:	○ Ad-Hoc ⊙ Infrastructure
SSID:	kryptonite (Leave field blank to use any SSID)
Channel:	6 💌 (used only with Ad-Hoc mode)
Tx Rates:	11 (Mbits/s)
Access Point Density:	High (used only for Infrastructure mode)
WEP enabled:	
WEP Key Length:	For proper use of WEP, also select "Deny Unencrypted Data" and set Authentication to "Shared Key" when WEP is enabled 128 bit • For 64 bit keys you must enter 10 hex digits into the key fields, for 128 bit keys you must enter 26
	means a key of all zeros.
WEP key 1:	
WEP key 2:	
WEP key 3:	
WEP key 4:	
WEP key to use:	Key 1 -
Deny unencrypted data:	□ (For use when WEP is enabled)
Shared Key Authentication:	□ (For use when WEP is enabled)
	Save Cancel

Network Mode:

\_

- **Infrastructure Mode**: This is the environment that allows access to other networks, such as the Internet and LAN, though an access point using the wireless network. Settings like SSID and WEP need be specified to be compatible with the access point settings in order to establish communication.
- In this mode, the channel is adjusted automatically to the channel the access point (AP) is using, thus you do not have to select the channel setting.

- Ad-Hoc Mode: This mode configures a wireless network that can be connected to a PC with a WLAN adopter or to another CW1130MU0 module without an AP. In this mode, you cannot communicate with other networks like the Internet or LAN. All settings must be configured appropriately (identically) with the other end user.
- In this mode, the user can select the channel. If both end users of the Ad-Hoc mode select different channels and it is possible to communicate using all other settings that are properly set, the channel will be switched to the channel of the user who first switched to the Ad-Hoc mode.

#### • SSID: According to the Network Mode, set the SSID as follows:

Network Mode	Setup Procedure		
	You can enter the SSID of the access point you are planning to		
Infrastructure Mode	use or leave the field blank so that you can connect to any		
	available access point nearby.		
Ad-Haa Mada	All devices in the same Ad-Hoc communication mode must have		
Au-Hoc Mode	the same SSID. You cannot leave the SSID field blank.		

✗ SSID is case sensitive.

- Channel: Please refer to previous information on the network mode setting.
- Tx Rates: This sets the data transmission speed.

★ We recommend that you set the Tx Rate to 'Automatic'. The 'Automatic' setting allows the fastest data transmission speed available under given distance or surrounding conditions.

- Access Point Density: If the network mode is set to 'Infrastructure', you need to select the access point density to one from Low/Medium/High. When several access points are installed in a small area, you need to select 'High'. When one or two access points are installed in a relatively large area, you can select 'Low'.
- WEP enabled: WEP (Wired Equivalent Privacy) is a data encryption method for the wireless network security. To enhance the data security, select the WEP enabled option and configure the remaining page as explained below:

If the network mode is in the Infrastructure mode, its WEP setting needs be identical to the WEP setting of the access point you are planning to use. Otherwise, you cannot access the network or cannot communicate with the network even after you are connected to the network

\* If the network mode is in the Ad-Hoc mode, all devices participating in the

same Ad-Hoc wireless network need have the identical WEP settings.

- WEP Key Length: To access and communicate with the wireless network using WEP, the WEP Key length must be selected. There are 64 bit and 128 bit options.
  - 64 bit: The WLAN security is maintained using the 64 bit long WEP Key.
  - 128 bit: A higher WLAN security level is maintained using the 128 bit long
     WEP Key. Compared to the 64-bit WEP Key, this option provides a much higher security level but at a somewhat slower data transmission speed.
- WEP Keys 1 to 4: The WEP Key length value is entered as given below. (If not selected in the 'WEP Key to use' explained below, you can leave the field blank.)

WEP Key Length	Value
64 bits	10 digit hexadecimal number
128 bits	26 digit hexadecimal number

\* Hexadecimal: expressed in a combination of numbers from 0 to 9 and letters from A to F. (In hexadecimal, letters, A to F, correspond to 10 to 15 in decimal)

- WEP Key to use: Selects the WEP Key ID that will be used for data transmission. The WEP Key selected here must be entered.
  - \* This value can be different than those values in the access point in the Infrastructure mode or in other terminals in the Ad-Hoc mode. However, all WEP Key values that correspond to WEP Key IDs used by the access point or individual terminals must be identical.
- Deny unencrypted data: Throws away all unencrypted data that are not encrypted by an appropriate WEP Key. We recommend that you should select this option when using WEP.
- Shared key Authentication: Specifies the authentication method to use. If checked, the Shared Key is applied. If not checked, the Open System authentication method is applied. As in the SSID settings, in the Infrastructure mode, the authentication setting must be the same as the setting in the AP that is to be connected. In the Ad-Hoc mode, all terminals (clients) must have the same authentication selection.

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Authentication	Function
Open System	Skips the WEP Key compatibility verification step and allows access. But, if WEP Key settings are not compatible, communication is not possible.
Shared Key	Access is allowed only after verifying the WEP Key compatibility.

\* The Shared Key method may be thought as more secure, but it has been known not to be the case. In the Shared Key authentication process, the WEP Key may be exposed during the WEP Key compatibility check. Thus, we recommend the 'Open System' option.

### 2.3 Server Configuration Page

KRYPTONITE	IEEE 802,11b 11Mbps Wireless LAN Info   Wireless ( IP Addr ) Stations   Admin	
Server Configuration	On this page you can configure the IP address used by the Web and TFTP servers running on this bridge. For "static" mode, the IP address setting are given below. For "DHCP" mode, these settings may be overridden by a DHCP server on your network. Any new IP settings will not take effect until the bridge is rebooted. NOTE: You may have to re-load this page to see the current settings	
IP Address Mode:	© Static ○ DHCP	
Default IP address:	192.168.11.30	
Default subnet mask:	255.255.255.0	
Default gateway:	192.168.11.1	
Device name:	(This is optional)	
Allow upgrade uploads:	☑ (Leave this off during normal operation)	
Cloning bridge:		
	Use this option to enable MAC cloning. Bridge will set the wireless interface to use the MAC address of a device from the wired side. Multiple devices can be connected but only the first device will be cloned. This is required for special networking situations, Eg. XBox, or some IPX device networking.	

By clicking '**IP Addr'** in the upper menu bar, you can open the Server Configuration page. On this page, you can configure the IP address of the NM6000 module and other settings.

#### • IP Address Mode:

- Static: Assigns the IP address of the NM6000 module manually.
- **DHCP**: The IP address is automatically configured. For this mode, a separate DHCP server must be running.
- \* We recommend you use the 'Static' mode. In the DHCP mode, the module IP

address can be changed and you may run into problems in gaining access to the web browser to reconfigure or monitor the settings.

- Default IP address: Enter the IP address here.
- Default subnet mask: Enter the subnet mask address here.
- **Default gateway**: Enter the default gateway address here. When using any IP sharing(Internet sharing) device, enter its IP address. Otherwise, enter the address of the router.
  - When entering the IP address, subnet mask, gateway addresses, consult your network administrator and ask for the address information. When no network administrator is available or you are not familiar with the address system, use the following steps to configure the address settings after checking the address of the gateway device (IP sharing device or router).
    - First, make the subnet mask address (or, network mask) the same as the subnet mask of the gateway device. Usually, the address setting is 255.255.255.0 (If you are not familiar with the IP address system, set the subnet mask address to 255.255.255.0).
    - The IP address should not be any address assigned to any other devices previously used and should be an address with the last digit closest to the gateway address.
- **Device name**: When using or managing a number of NM6000 modules, you should assign an easily recognizable name to each module.
- Allow upgrade uploads: This option must be selected to upgrade the firmware of the NM6000 module.
- Cloning bridge: Enables the NM6000 module to use, as its MAC address, the MAC address of a device that is connected to a wired network (Ethernet). When a number of devices are connected through a hub or switches, the MAC address of the first connected device will be used. Special networking situations, like Xbox and devices using the IPX protocol, need this function.

#### 2.4 Stations Page

The NM6000 WLAN module is a bridging device that connects a wired network (Ethernet) and a wireless network together. To cross the bridge, you have to ask whom (stations/terminals/clients) you are meeting across the bridge. Only when there is someone (stations/terminals/clients) across the bridge, you can cross the

bridge. To verify information about the stations, a bridge table is set up.

On this page, you can verify information about the stations listed in the bridge table. By clicking '**Stations'** in the upper menu bar, you can display the below page.

KRYPTONITE "	:EE 802,11b 11Mb 1fo   Wireless   IP	ps Wireless LAN Addr   Stations   A	Admin
Stations	Information about the stations that are being bridged. NOTE: You may have to re-load this page to see the current settings.		
	The bri	dge table	
	IP Address	MAC address	
	10.0.0.215	000021EA384B	
	10.0.0.44	0050DA8E2D2C	
	10.0.0.80	00010234D3FB	
	10.0.0.179	0010A4E90F63	
	10.0.0.24	0057BFFFC82E	
	10.0.0.163	0050FC0CC94B	
	10.0.0.71	0050DA8C7519	
	10.0.0.4	0050BF243C13	
	10.0.0.100	00900802149C	
	10.0.0.11	0050DA8C744E	
	10.0.0.1	0050DA8E2530	

# 2.5 Administration Page

By clicking 'Admin' in the upper menu bar, you can open the Administration page. On this page, you can change your password, restart the NM6000 module by rebooting, restore the default settings by clicking the Reset button, or upgrade the firmware of the NM6000 module (Please see the next section of the User's Guide for this).

KRYPTONITE	IEEE 802,11b 11Mbps Wireless LAN
Administration	On this page you can change the password, reboot the access point, or reset all settings to their factory defaults. If you have changed any settings it is necessary to reboot the access point for the new settings to take effect
User name:	
Administrator	(Re-enter for confirmation)
password.	Save Cancel
Commands	
Reboot bridge:	Reboot
Reset to factory defaults:	Reset
Firmware upgrade:	firmware upgrade

# 2.6 Storing and Applying New Settings

For setting changes, there are Save and Cancel buttons in the Wireless Configuration page, the Server Configuration page, and the Administration page. The buttons have the following functions:

Save Button: Stores setting changes. When there is no error in the setting values entered by the user, the below success message is displayed.
 Up to this point, new settings are only stored. New settings will take effect, when you restart the NM6000 module by clicking the 'Reboot' button.

KRYPTONITE	IEEE 802,11b 11Mbps Wireless LAN Info   Wireless   IP Addr   Stations   Admin
SUCCESS	The new settings have been applied, or the command has succeeded. The access point must be rebooted before the new settings will take effect (see the "admin" page, or use the button below). Reboot

• Cancel Button: Setting changes are cancelled. Restores the previous settings.

# 3 Upgrading the Firmware

For the NM6000 module, the firmware can be upgraded using a web browser. To upgrade the firmware, go through the following steps.

### 3.1 Getting the Latest Version of the Firmware

Check at the store where the module was purchased or on the WIZnet's website (<u>http://www.wiznet.co.kr</u>) to see if the latest version is available. If so, download it.

#### 3.2 Accessing the NM6000 Module using a Web browser

In the Web browser address field, enter the IP address of the NM6000 module to be upgraded.

For more information, please refer to the '2 CONFIGURING SETTINGS' section of the User's Guide.

#### 3.3 Starting Allow upgrade uploads

- By clicking 'IP Addr' in the upper menu bar, open the Server Configuration page.
- 2 Click the 'Allow upgrade uploads' option.
- ③ Save setting changes and reboot the NM6000 module.
- \* For more information, please refer to '2.3 Server Configuration Page' section of the User's Guide.

# 3.4 Opening the Firmware Upgrade Page

- ① By clicking 'Admin' in the upper menu bar, open the Administration page.
- ② By clicking the 'firmware upgrade' button, open the firmware upgrade page (see 2.5 Administration Page of the User's Guide).

3.5 Uploading a Firmware File

KRYPTONITH	IEEE 802.11b 11Mbps Wireless LAN Info   Wireless   IP Addr   Stations   Admin
Firmware Upgrade	Warning: Uploading a new image (if succeeds) will overwrite the existing filesystem.
File to upload:	Press to upload the file!

① By clicking the **'browse'** button, find the firmware file that was downloaded previously.

파일 선택					<u>? ×</u>
찾는 위치(]):	🔄 Kryptonite		•	🗢 🗈 💣 📰 •	
<mark>않</mark> 최근 파일	web_files	_1.0.A.0.bin			
바탕 화면					
내문서					
내 컴퓨터	 파일 이름( <u>N</u> ):	kryptonite_bridge_1,0,A,0,bin		•	열기( <u>0</u> )
네트워크 환경	파일 형식( <u>T</u> ):	모든 파일(*,*)		•	취소

② By clicking 'Press' button, upload the firmware to the NM6000 module. When successfully uploaded, the following UPLOAD SUCCESSFUL page pops up.



# 3.6 Verifying the Firmware Version after Rebooting

When the firmware upgrade is successfully completed, the NM6000 module automatically restarts. After waiting about 15 seconds, open the **Information Page** and check to see if the same version as the one uploaded is shown.